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MAY, 1953

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National Formulary Progress

THE AMERICAN PHARMACEUTICAL ASSOCIATION justly takes pride in the publication of the *National Formulary*. It, and the *U. S. Pharmacopeia*, constitute the most important official compendia under the Federal Food, Drug and Cosmetic Act and equivalent state acts.

When a substance is listed in the *National Formulary* for therapeutic use, it is legally a drug within the meaning of federal and state drug laws. This places a heavy responsiblity on the Committee on National Formulary which revises the text of this official compendium and determines its scope and content.

Because of its official status it has been the policy of the *National Formulary* to follow the procedure of pharmacopeias in the preparation of the monographs of the drugs listed. However, there is an insistent demand from the users of the *National Formulary* to broaden its usefulness by publishing certain information somewhere in the book which will make it unnecessary to continuously consult other texts in order to verify action and uses, synonyms, trade names, and other essential information needed by practitioners of medicine and pharmacy at the time N.F. drugs are prescribed.

It will be welcome news, therefore, to the members of the A.PH.A. and to the users of the *National Formulary* that the Committee on N.F., in session at Washington, D.C., on April 30 and May 1, took steps to assure inclusion of much useful information in the appendix of the book, which will supplement the standards and other technical data given in the monographs.

One significant action taken by the Committee was approval, in principle, of the inclusion in N.F. X of basic action and use information on N.F. drugs. It is believed that this feature will add to the interest and usefulness of the *National Formulary* if it can be definitely segregated from standards of strength, quality, and purity of the drugs concerned.

In addition to action and use information, the Committee discussed and approved the addition of a section on Emergency Treatment of Poisoning, for N.F. X.

In order to provide information on drugs used by specialty groups, Sections on Chiropody-Podiatry Preparations, Dental Preparations, and Veterinary Drugs will become a part of the new *National Formulary* if plans made by the Committee come to fruition.

In the last two editions of the *National Formulary*, tables of certified coal tar colors and their solubility characteristics have been included. This section, according to plans approved by the Committee, will be considerably increased in scope by including pertinent information on choice, application, and more details of the physical and chemical characteristics of a limited number of dyes sufficient to serve most pharmaceutical purposes as far as coloring preparations of various types are concerned.

Plans were formulated for a complete revision of the Section on Reagents and Preparations Used in Clinical Laboratories. Dr. R. A. Deno, a member of the Committee, assumed responsibility for the revision of this section. It is planned to condense this part of the book materially to include only preparations that the practicing pharmacist might be called upon to prepare for physicians and clinical laboratories.

Progress reports were received on the present status of sections relating to speci-

fications for clinical thermometers, measuring devices, and prescription balances.

Many details of significance in the establishment of specifications for certain drugs were discussed and final decisions reached, but the highlights hinged around the plans to produce a new edition of the *National Formulary* in 1955 that, in addition to supplying official standards of strength, purity, and quality, will also provide, in a usable and understandable form, information heretofore neglected by the official compendia and often not readily available in standard textbooks and reference books.

Pharmacists and Mental Health

ACCORDING to an editorial in the *Journal of the A.M.A.* published May 2, figures compiled by the National Association for Mental Health show that in the United States, on any given day, mental hospitals have as many patients as there are in all other hospitals combined. In addition there are 120,000 mentally deficient and about 20,000 epileptic patients in special institutions. Each year about 250,000 new patients are admitted to mental hospitals and about 100,000 more who have been in mental hospitals before are readmitted. At least 200,000 persons, including children, are seen annually in psychiatric clinics and an unknown number visit private psychiatrists for treatment.

The number of persons who have some form of mental illness or personality disorder has been estimated to be about 9,000,000 including 1,500,000 with incapacitating psychosis or neurosis and 7,500,000 with less severe forms of neurosis, behavior disorder, or psychopathic personality.

It is estimated that 30 per cent of all patients who go to general hospitals and 50 per cent of all patients who go to general practitioners are suffering from mental illness, personality disturbance, or physical illness associated with these conditions. It is clear from these figures that mental illness is a major medical problem from the standpoint of total disability and suffering produced.

Our readers have been given an insight into this problem by the series of articles on the subject, of which the one in this issue is the third. Dr. R. H. Felix, Director of the National Institute of Mental Health, author of these articles, is well qualified to write on the subject and we have been especially impressed with the role he has outlined for the pharmacist in coping with this problem. The mentally ill require our most intelligent and sympathetic consideration. They are not to be looked upon as freaks or queer people. They need help, and well-informed pharmacists who can detect the necessity for special care may prove the friends in need to thousands who can be helped by modern methods of diagnosis and treatment.

We appreciate the confidence expressed in pharmacists as a class by Dr. Felix and his associates and we urge a most careful reading of the three articles which have appeared in THIS JOURNAL beginning with the March issue.

We also urge all pharmacists to make themselves aware of the facilities offered by their respective communities for the treatment of the mentally ill and to let it be known to their health officials and institutional supervisors that they are ready to cooperate in supporting community planning and research in this field.

Helping the Dermatologist

THE series of papers in this issue of our JOURNAL dealing with dermatological products and their dispensing brings together some of the latest information on this important section of the art of compounding and dispensing. The ophthalmologists and the dermatologists constitute the pharmacist's chief source of extemporaneous prescriptions. To serve these specialists is a function which those who like prescription practice enjoy to the fullest extent. The successful application and absorption of drugs by and through the skin, present some intriguing problems for the dispenser as well as the prescriber. Nothing can create a closer bond between physician and pharmacist than experimentation in devising therapeutic measures for the benefit of sufferers from ailments whose cause may be obscure. Making facilities available and being willing to produce ointments, lotions, and other external applications on an experimental basis, for conscientious specialists, is practicing pharmacy on a most rewarding

(Continued on next page)

Straight from Headquarters

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level. We are glad to make the pages of THIS JOURNAL available for recording the results of research in this and other fields of dispensing.

The Power of Petition

UNDER this heading the Memphis, Tennessee, *Commercial Appeal* presented an editorial in its April 13 issue which we think every pharmacist should read. Not only should it be read because it gives deserved recognition to the students of the School of Pharmacy of the University of Tennessee for a job well done, but it should be read for the lesson that it carries to the profession of pharmacy in the United States. The editorial reads as follows:

> We like the democracy of a small incident during the final day of rush and tension in the Tennessee Legislature.
>
> A bill had been quietly moving through legislative channels which would have required the pharmacy board to license any assistant pharmacist who has been practicing since 1931, provided he could have been licensed if he applied then. Druggists who have been rejected by the pharmacy board would have been allowed to fill prescriptions without meeting pharmacy board requirements.
>
> Without preliminary publicity or fanfare of any kind, 84 students of the School of Pharmacy, University of Tennessee, left the Memphis campus and appeared in the Capitol. These students are using time and money for four years of college in the hope of being awarded the degree of Bachelor of Science in Pharmacy. Until they have obtained the degree, and had a year of drug store experience and passed the state board examination, none of them will obtain their licenses.
>
> Of course they were opposed to a law which would have cheapened those licenses. We suppose that is what they said to the legislators.
>
> Whatever words they used, they were sufficient. The Senate had approved the law the day before the pharmacy students arrived in Nashville. The student lobby appeared. The House tabled the proposal.
>
> The ancient right of petition under our form of government had proved its high value once more.

Some of us have replied to those who have urged public relations campaigns in behalf of the profession of pharmacy that every pharmacist and every pharmacy every day furnish the material which establishes pharmacy's public relations. No profession can rise above the acts of its members. When those acts are in the interests of the public they will commend themselves to the press and to others who are responsible for disseminating worth-while information.

It is beyond this profession or any other to buy editorial comment like that quoted above. It is not beyond every member of the profession to so conduct himself and to so impress his services upon his clients and the public at large as to call forth commendation and praise which is genuinely bestowed and not manufactured for artificial dissemination.

Service Well Performed

FOR a number of years Commander R. L. Taylor has served as liaison officer from the Bureau of Medicine and Surgery of the U.S. Navy to the A.PH.A. Committee on National Defense and Security. During the time that Commander Taylor has been stationed in Bethesda and in the Bureau of Medicine and Surgery in Washington, D.C., in charge of the hospital corps school for the training of hospital corpsmen, he not only made an excellent record in his supervision of the teaching program, but he also kept the members of the Committee on National Defense and Security, as well as the steering committee of the Committee on Pharmacists in the Government Service, aware of the activities of the Navy with respect to pharmacy.

He has been assigned to a tour of duty at the San Diego, California, naval center, where he will have charge of training of hospital corpsmen in one of the Navy's largest installations.

In Washington he will be succeeded by Lieutenant Commander Kenneth E. Bechtloff, a graduate of Duquesne University and an able officer, who has also been named by Navy Surgeon-General Lamont Pugh to serve as liaison officer to the A.PH.A. Committee on National Defense and Security.

We welcome Commander Bechtloff to his new assignment and our thanks and appreciation are extended to Commander Taylor for service well performed.

a symposium: new aids and procedures for compounding dermatologic products

THE PRESENT state of active interest in the preparation of suitable dermatologic products is evidenced in the group of related reports presented at the Centennial Convention of the AMERICAN PHARMACEUTICAL ASSOCIATION in Philadelphia, last August and now published on the following 25 pages. Presented by eleven teams of investigators, and read before the Section on Practical Pharmacy, the papers are concerned with the development of better and more convenient compounding procedures and formulas for dispersions of dermatologic medicinals.

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Physician and Pharmacist Cooperation IN DERMATOLOGIC MEDICATION

There are many areas of common interest where the two specialists, dermatologist and pharmacist, can cooperate in prescribing, and compounding, the best possible medication

By Samuel W. Goldstein

Director of the A.Ph.A. Laboratory

IT IS true that dermatology has rapidly come a long way from the not far distant period when cases were classified as: those that got well with calamine lotion, those that got well with zinc paste, and those that could not be cured. The modern dermatologist is truly a specialist, for, when a patient is finally referred to him it is indeed a special case and it usually requires special treatment. The treatment can vary from psychosomatic therapy (for certain warts), to internal medication for dermatoses, e.g., chloromycetin, terramycin (1,2); but topical medication still predominates in dermatologic practice. Topical medication places high concentrations of therapeutic agents, some of which are toxic if taken internally, directly at the site of action.

The special nature of each case the dermatologist treats often precludes the prescribing of manufactured products, and this accounts for the fact that dermatologists write for a higher proportion of prescriptions that require extemporaneous compounding than do other medical practitioners. In the formulation and compounding of these prescriptions, the dermatologist wants vehicles that will make the medication less disagreeable to the patient, that will have the desired degree of penetration, that can be removed without causing discomfort or trauma, and that will insure reasonable uniformity when compounded repeatedly. In order to attain these ends, the dermatologist can rely upon another specialist, the compounding pharmacist, who has spent more time in the study of the required art and science than any other professionally trained individual. The pharmacist knows how an oil-in-water or a water-in-oil emulsion should be prepared with an oily ingredient. He knows of the different suspending agents available. He is learning that one cannot use surface-active agents "ad lib." merely to achieve attractive products; because such agents might increase the penetrating ability of a drug to the point of systemic intoxication. If the dermatologist desires to avoid interference with the "acid mantle" of the skin (3), the pharmacist can adjust the pH of the preparation.

Clinical Tests of Preparations

Therapeutically acceptable data pertaining to the effectiveness of dermatologic medicinal agents in different types of liquid or semisolid vehicles, with and without surface-active agents, can be obtained only when medical and pharmaceutical teams, with proper research techniques and clinically abundant test cases, cooperate to that end.

It is true that in the field of investigative dermatology, the dermatologist is confronted with a preponderance of cases in which he must experiment with different medicinal agents in his search for an effective treatment. When an effective agent is found, it frequently makes little difference what carrier is used to make the topical application. In certain, well-established conditions, where the best available medicinal agent does not satisfy therapeutic demands, it is well to determine the effects of the agent in different vehicles. In this type of study, use of "simultaneous symmetrical paired comparisons" as described by Sulzberger, *et al.* (4), should facilitate accumulation of significant data. The data obtained from such experimental studies are utilized in the development of treatment patterns for other established conditions and in future designs for investigative therapy.

After the dermatologist-pharmacist teams have developed certain fundamental data, which indicate preferential types of vehicles for specific therapeutic effects of medicinal agents under noted conditions, this information can be disseminated among the practicing pharmacists and they, in turn, can advise the prescribing physicians of the newer developments. The Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION considers the dissemination of such information to be a major function of the JOURNAL.

Presented before the Dermatologic Section, Johns Hopkins Medical School, Baltimore, Md., March 26, 1953.

Calamine Lotion

In addition to reporting the work of other investigators, the A.PH.A., in its Laboratory, has been preparing and testing, chemically and pharmaceutically, some vehicles for dermatologic preparations. Work on calamine lotion was undertaken in an attempt to prepare a lotion that would have the desirable properties of the U.S.P. XIV preparation, but which would also permit the addition of 1 per cent of liquified phenol in the preparation of Phenolated Calamine Lotion N.F. The U.S.P. XIV formula includes an emulsifying agent, polyethylene glycol 400 monostearate, which loses its emulsifying power when phenol is added.

Work at the A.PH.A. Laboratory was progressing well enough with formulas utilizing glyceryl monostearate and sodium lauryl sulfate, or cetyl alcohol and Tween 61, along with other emulsion-type lotion ingredients. We decided to try to make a product that would dry to form a flexible, water-miscible film, from which the medicinal agent would be constantly available.

The idea was not new. Medicated collodions, from which a bland medicinal agent could not escape, have been used for many years as protective coatings and superficial wound closures. Pickrell's work at The Hopkins with sprayed and preformed sulfonamide films was reported in 1942 (5). For our purpose, a suitable material was available, because the A.PH.A. Laboratory was working on a monograph for sodium carboxymethylcellulose, a non-toxic, non-allergenic, film-forming substance that was finding increasing use in pharmaceutical preparations. A number of experiments yielded the formula for the calamine lotion that has been reported (6). The same vehicle is recommended for neocalamine lotion.

Some dermatologists utilize calamine lotion as a vehicle for additional medicinal agents. Tests indicated that the new product would serve very well as such a carrier, as well as for a base lotion from which to prepare the N.F. phenolated lotion. The formula was offered to the U.S.P. Revision Committee, and, after much critical study, the Chairman of the Subcommittee on External Preparations has recommended its adoption by the U.S.P.

Liquid Vehicles

The vehicle portion of the new calamine lotion was then tried as a carrier for other dermatologic medicinals, and it appears to function well in many mixtures (7). In all these preparations the vehicle acts either as a solvent, or as a suspension medium due to the viscosity and protective colloid effect of the cellulose derivative (NaCMC). Further study proved that in some instances, particularly when the anionic nature of NaCMC might cause a chemical incompatibility, use of non-ionic methylcellulose yields a more stable product (8).

Solvent vehicles can exert some therapeutic effect, such as the antiseptic action of alcohol or alcohol-acetone mixtures, the dehydrating action of glycerin, the protective coating of film-formers. The selective preference for the vehicle in some liquid dermatologic preparations is based upon pharmaceutical considerations, other than the important factor that sensitizing or allergenic ingredients should be avoided.

In reports of pharmaceutical experiments with different suspending agents, such as alginates, cellulose derivatives, bentonite, Veegum, aluminum hydroxide or phosphate magmas, modified starches, etc.; or reports on different solubilizing or emulsifying agents, such as the Tweens, cetyl and/or stearyl alcohols, glyceryl esters, aliphatic sulfonates, etc., one finds few authors who state that the substances tested yielded unsatisfactory preparations. Under certain conditions all of these materials can yield pharmaceutically esthetic preparations. It is only when the clinician has applied these materials to large numbers of patients that their usefulness can be appraised.

Harry (9) concludes a discussion on emulsions with the statement: "For general pharmaceutical and dermatological formulation, the oil-in-water type of emulsion is pre-eminently superior. Its non-greasy and esthetic nature, non-interference with skin radiation, miscibility with serum and the fact that this type of emulsion does not inhibit bacterial action, makes it unique."

Ointments

There are still some types of dermatoses that require grease or petrolatum vehicles. However, recent pharmaceutical investigations have dealt largely with the development of water-washable, water-soluble, or hydrophilic ointment vehicles containing cetyl and/or stearyl alcohol with sulfated alcohols or with sodium lauryl sulfate, carbowaxes, Tweens and Spans, aluminum and mag-

(Continued on next page)

Author's Summary

The growing specialty of dermatology is utilizing thes ervices of the compounding pharmacist.

While the proportion of all prescriptions that require compounding has fallen below 25 per cent, more than 30 per cent of the prescriptions for dermatologic medication request special mixtures that must be prepared extemporaneously.

The pharmacist should indicate in every possible manner his desire and his ability to retain and increase the present reliance of the dermatologist upon the pharmacist's special knowledge.

The manner in which the two specialists, the dermatologist and the pharmacist, should cooperate is indicated.

From Preceding Page

nesium silicon hydrates, and cellulose derivatives (8,10,11,12,13,14). Investigations with water-in-oil emulsified ointments (15), hydrocarbons (16), and a base containing dehydrated egg oil (17) have also been reported. The U.S.P. recognizes two water-miscible ointments (18).

For dermatologic purposes, ointment vehicles can be classified as epidermic or endodermic, depending upon the extent to which they permit the medicinal agent to penetrate the skin. Generally, the hydrophilic vehicles permit more ready absorption; especially if surface-active agents are included in the formulation.

Treatment of a dermatitis, caused by a microorganism, with an ointment from which the medicinal agent does not diffuse is comparable to the use of a plain or treated sterile dressing, which protects against external contamination but does not aggressively attack the established invader. In some conditions, especially where large denuded areas are present, that might be the desirable type of preparation to use. Protective ointments are used in the practice of preventive dermatology. A recent development in this specialty utilizes the inert but water-repellant nature of the silicones by application in a petrolatum base (19) in conditions varying from diaper rash to protection against contact dermatitis.

In the treatment of a deep-seated dermal infection, the dermatologist might prefer to apply the medicinal agent in a vehicle that will aid or permit absorption or penetration into the dermal layers or even through them. Lanolin or wool fat is often added to ointment vehicles to enhance such action. Some early investigators reported that the effect of wool fat on absorption was inferior to petrolatum. Dr. Luff (20), in 1890, recommended that lanolin be used in ointments employed for "local effect only, absorption of the active ingredient not being desired." Sauerland (21), using urine-excretion data and bases of petrolatum, lard, and lanolin, reported the greatest rate of absorption of iodide from petrolatum and the least from lanolin. Ethyl salicylate was absorbed most readily and most completely (15 per cent) from lanolin.

Since those early studies, most of the experimental data indicate better absorption of active ingredients into or through the skin from bases containing lanolin than from comparable petrolatum preparations (22,23,24,25,26).

A disturbing factor in the use of lanolin was introduced by observations of eczematous hypersensitivity of human skin to lanolin (27,28,29,30,31). The Revision Committee for the U.S.P. XIV deleted lanolin from the official formulas for external preparations. The present chairman of the subcommittee directly concerned with these preparations includes lanolin in some products compounded in the pharmacy of the dermatology clinic with which he is associated (32). Bhatia and Zopf (26) recently reported the effect of lanolin and some of its components on the absorption of phenolsulfonphthalein through shaved, intact rat skin. The excreted dye was determined in 24-hour urine samples. The test bases were lanolin, petrolatum, and Polyethylene Glycol Ointment U.S.P. XIV. The P.E.G. ointment was definitely better than petrolatum for permitting absorption of phenolsulfonphthalein, but absorption from lanolin was about 2.5 times that from the P.E.G. ointment. No absorption from pure petrolatum was detected in a 24-hour period. Addition of 10 per cent of lanolin, cholesterol, or isocholesterol to the P.E.G. ointment permitted greater absorption than from the pure lanolin base; and, when incorporated in the petrolatum they increased the absorption to about four-fifths the amount from pure lanolin.

The authors conclude that "The use of cholesterol does not offer any advantage over the use of wool fat (lanolin); there was no significant difference in their results."

Sulzberger, Warshaw, and Herrmann (33) reported twelve out of 1,084 dermatologic allergy patients showed consistently positive skin reactions to patch tests with lanolin. No skin reactions occurred in 120 healthy subjects. Inunction of lanolin on uncovered skin produced mildly positive reactions in only two of 18 patients hypersensitive to patch tests with lanolin. Of 12 subjects with positive patch tests to lanolin, 11 showed a positive test to the aliphatic alcohol fraction; but only one of these reacted to the same fraction after its acetylation. Not one positive patch test with cholesterol (from lanolin or from spinal cord of cattle) was noted in 19 individuals hypersensitive to lanolin.

These two reports would seem to indicate that relatively non-allergenic ointment bases, from which at least certain medicinal agents would be aggressively available at the site of application, can be prepared with cholesterol as one of the ingredients.

Another observation in the report by Sulzberger, *et al.* (33), is that cetyl alcohol produced a positive patch test response in two of 18 dermatologic allergy patients hypersensitive to lanolin. In 1951, Robinson, Zeligman, Shapiro, and Cohen (34) presented an investigative report on "Acquired Contact Sensitivity to Chloromycetin." Two out of 70 patients had acquired sensitivity to one per cent chloromycetin cream, after treatment of dermatoses for 21 days and 52 days respectively. The two patients gave positive patch tests with the cream and with chloromycetin powder, but gave negative tests with the cream base, which contained cetyl alcohol 12.0, heavy liquid petrolatum 10.0, Duponol C 1.0, propylparaben 0.1, and distilled water to make 100.0 parts.

Measurement of Diffusion from Ointments

A number of methods have been used to determine diffusion of medicinal agents from ointment bases, and the penetration of the agents through the skin. Some recent studies are based upon diffusion from ointment bases into agar gels (35,36,37), onto or into rat tails (38), and through egg shell membranes (39). Methods based upon the incorporation in different vehicles of a drug that can be determined in a body fluid or the urine actually measure the absorption and excretion of the drug and do not express the independent penetrating properties of the vehicle. The test method will not necessarily work with a drug which in itself is not readily absorbed.

All of these methods give some information about the properties of the ointment bases studied under the particular conditions of the tests. None of these test methods yield information that will enable one to predict with any degree of certainty how a particular ointment base will act as a vehicle for a certain drug in a group of patients requiring dermatologic therapy. The soundest knowledge that has been accumulated and that will be acquired in the near future has come from, and will be reported by, observant medical practitioners, especially from those dermatologists who work under clinically controllable conditions, and with competent pharmaceutical collaboration.

It is definitely in the interest of the patient that the team of specialists, the dermatologist who diagnoses the condition and determines the therapeutic treatment, and the pharmacist who compounds the requested medicinal agent into the most conveniently administered effective preparation, should function cooperatively in the field of dermatologic medication.

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THE *Calamine Lotion* PROBLEM

BY F. B. Gable,† H. B. Kostenbauder,† and A. N. Martin‡

THE present status of Calamine Lotion U.S.P. XIV has been reviewed by Goldstein (1) and others (2, 3). Although the official formula possesses certain desirable characteristics of cream-like consistency and acceptable spreading qualities, it has presented a problem to the manufacturer as well as the practicing pharmacist. Excessive foaming during manufacturing, inability of the product to flow freely from small bottles, and incompatibility with phenol have made it unacceptable.

As a result of the disadvantages of Calamine Lotion U.S.P. XIV, various studies have been conducted to correct or improve the product. The present investigation was undertaken to evaluate and compare some of the formulas recently suggested along with those originating in our own laboratory. The properties investigated included sedimentation, viscosity, particle size, compatibility with phenol, and spreading and drying qualities on the skin.

Preparation of the Lotions

Each lotion was prepared in a quantity of 1000 cc. and then twice passed through a hand-homogenizer. Measurements on the products were made at weekly intervals for a period of six weeks.

The first group of lotions in the survey contained sodium alginate as the basic ingredient. It was determined that 1.25 per cent sodium alginate with 4.0 per cent (w/v) glycerin formed an acceptable base as a suspending vehicle and for application to the skin. The sodium alginate dispersions were prepared with distilled water containing 0.2 per cent methylparaben as a preservative.

(Continued on next page)

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Formula "A"

Sodium Alginate	12.5 Gm.
Calamine	80.0 Gm.
Zinc Oxide	80.0 Gm.
Glycerin	40.0 Gm.
Methylparaben	2.0 Gm.
Distilled Water *q.s.*	1000.0 cc.

Method of preparation: Methylparaben was dissolved in distilled water with the aid of heat. Sodium alginate was sprinkled on the warm solution (500 cc.) and stirred with a mechanical mixer. The remaining powders were then mixed together and rubbed up with the glycerin and previously prepared dispersion. Enough of the methylparaben solution was added to make 1000 cc. and the mixture was shaken well.

Formulas "B" and "C" were prepared by the addition of 0.1 per cent Tween 20[a] and 0.01 per cent Aerosol OT[b] respectively to Formula "A." In preparing Formula "B" the alginate dispersion was slowly added to the Tween before it was incorporated with the powders. Formula "C" was prepared by dissolving the Aerosol OT in water preserved with methylparaben before preparing the dispersion.

A formula suggested by Goldstein (1) is referred to as Formula "D" in this investigation. Lotion "E" is similar to one suggested by Marcus (4), the formula of which is:

Lotion "E"

Calamine	80 Gm.
Zinc Oxide	80 Gm.
Glycerin	100 cc.
Veegum HV Magma, 3 per cent	
Distilled Water, each	
a sufficient quantity to make	1000 cc.

Formula "F" is Calamine Lotion U.S.P. XIII in which lime water is replaced by distilled water. Calamine Lotion U.S.P. XIV is designated as Formula "G." A number of other products were investigated but since they proved to be unsatisfactory or were subjected only to preliminary study, they will be referred to in a later paragraph.

Investigation of Lotions' Properties

The properties of the test lotions were studied and recorded at weekly intervals for a period of two months.

Viscosity: Viscosities were measured with a Brookfield Synchrolectric-viscometer. This instrument involves the principle of a spindle rotating in a cup, containing the lotion, at a given speed of 2, 4, 10, or 20 r.p.m. The initial and final viscosities of the lotions are recorded in Table I. It may be observed that the viscosities were not constant but varied considerably in several of the products. Although Formula "D" had a high initial viscosity, the value dropped markedly at each successive reading over a six-week period.

TABLE I.—VARIATION OF VISCOSITY WITH TIME[a]

Formula	Initial Viscosity (Cps)	Final Viscosity[b] (Cps)
A	1160	620
B	950	650
C	1000	520
D	1860	270
E	5500	8200
F	310	480
G	11250	9700

[a] Measurements made with a Brookfield viscometer, spindle speed 4 r.p.m.
[b] Results obtained after six weeks.

Particle Size. The particle size of the dispersed powders was determined at weekly intervals with an optical microscope fitted with a calibrated micrometer. The results are contained in Table II.

TABLE II.—CHANGE OF PARTICLE SIZE WITH TIME

Formula	Initial Particle Size (microns)	Final Particle[a] Size (microns)
A	1–2	2–3
B	1–2	2–3
C	1–2	1–3
D	1–3	2–4
E	5–30[b]	5–50[b]
F	2–3	10–12[c]
G	2–4	6–8[c]

[a] Results obtained after six weeks
[b] Considerable Flocculation
[c] Moderate Flocculation

Sedimentation: Into calibrated glass-stoppered cylinders were placed 100 cc. of each lotion; the containers were then sealed with wax. Sedimentation of the powders was recorded at weekly intervals, the results of which may be observed in Table III. It may be seen that the sedimentation parallels the change in particle size. However, there is no apparent relationship between variation of viscosity and rate of sedimentation.

Phenol Compatibility: Lotions were prepared containing 2.0 per cent phenol and were then stored in 100-cc. cylindrical glass-stoppered graduates which were sealed with wax. The degree of separation and sedimentation was noted at weekly intervals as shown in Table III. Only Lotion "G" was affected by the addition of phenol, the slight variations between sedimentation in the other plain and phenolated products being considered as insignificant.

Application to the Skin: The lotion samples were compared by subjective tests for their spreading and covering power, drying time, adherence and cracking or peeling on the skin. It is interesting to note that a sodium alginate or sodium carboxymethylcellulose lotion does not spread on the skin but rather coalesces into small globules. Such a phenomenon may be attributed to a high interfacial tension between the skin and the dispersion. This "lipophobic" property

[a] Available from Atlas Powder Co., Wilmington, Del.
[b] Dioctyl Sodium Sulfosuccinate, available from American Cyanamid Co., New York.

of these suspending agents, however, may be overcome by the addition of a wetting agent, Aerosol OT, as previously noted by Goldstein (1). The characteristics of the various products upon application to the skin are compared in Table III. Formula "C" is seen to have poor spreading properties on the skin due to an insufficient quantity of Aerosol OT. It has later been observed that 0.05 per cent concentration of this wetting agent is sufficient to produce a lotion with acceptable spreading qualities. The use of Aerosol OT in Lotions "C" and "D," however, has the objection of imparting a marked odor to the product which is not especially pleasing. Although Lotions "E" and "G" are reported as excellent regarding their application to the skin, they possess other properties which are unfavorable. Lotion "E" shows large variability in particle size and considerable sedimentation. The disadvantages of Lotion "G" have been noted previously.

TABLE III.— SEDIMENTATION AND APPLICATION-PROPERTIES

Formula	Per Cent —Sedimentation[a]— Plain	Phenolated	Application to the Skin
A	0	0	poor
B	0	0	good
C	2	0	poor
D	9	11	good
E	19	13	excellent
F	29	30	good
G	8	*b*	excellent

[a] Per cent sedimentation indicates the cc. of clear layer on the surface of 100 cc. of lotion after a period of six weeks.
[b] Settles almost completely within several hours due to incompatibility

Dispersing Agents: Other agents were added to the basic formulas in an effort to retard sedimentation and improve the spreading and covering properties of the lotions. Daxad 23,[c] a polymerized sulfonic acid salt of the alkyl-aryl type, was added to Lotions "A" and "F" but exhibited no appreciable effect on sedimentation or spreadability of the product on the skin. Sodium hexametaphosphate, "Calgon,"[d] has been referred to in the literature as a deflocculating agent for titanium dioxide and other pigments (5). It was found to be unsatisfactory in Lotions "A" and "F."

[c] Available from Dewey and Almy Chemical Co., Cambridge, Mass.
[d] Available from Calgon Inc., Pittsburgh, Pa.

Authors' Summary

A number of newer calamine lotions have been compared with the established products. The following properties were investigated: viscosity, sedimentation, particle size, compatibility with phenol, and application to the surface of the skin.

A calamine lotion containing 1.25 per cent sodium alginate and 0.4 per cent Tween 20 has been found to represent the most acceptable product.

The use of Aerosol OT in lotions to improve the application properties has the objection of imparting a marked odor to the product which is not especially pleasing.

Lotion "B," which contained 1.25 per cent sodium alginate and 0.1 per cent Tween 20, was the most acceptable lotion of the test series under investigation. It possessed a moderate viscosity which did not change appreciably on aging, maintained a small particle size, and had good cream-like qualities when applied to the skin.

It has since been determined that a lotion containing 1.25 per cent sodium alginate and 0.4 per cent Tween 20 will further enhance the properties of application and improve the preparation. A lotion containing 2.0 per cent sodium carboxymethylcellulose and 0.4 per cent Tween 20 has recently been developed and found favorable. Its properties will be reported in a subsequent paper.

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Acne is still one of the greatest problems and its management is still the major activity of most dermatologic practices.

Dr. Marion B. Sulzberger, New York, at the Seventy-Second Annual Meeting of the American Dermatological Association, Colorado Springs, Colo., April 23, 1952.

A NOTE:

a Simplified CALAMINE LOTION

BY Arnold D. Marcus and Byrl E. Benton

PREVIOUS reports from this laboratory have indicated that suspensions of zinc oxide and calamine are stabilized very well through the use of Veegum-HV. From the data available through these investigations a study was undertaken to determine the applicability of Veegum-HV to the stabilization of the suspension in calamine lotion. In addition, care was taken to determine the compatibility of the suspending agent with phenol and to ascertain the ability of the lotions so produced to remain on the skin rather than rub off onto the clothing.

Preliminary studies indicated that concentrations of Veegum-HV ranging from 2 to 3 per cent (w/v) would serve the purpose of stabilizing the suspension remarkably well. These lotions when phenolated with either crystalline or liquefied phenol remained stable and the suspension was undisturbed. There was no evidence of incompatibility affecting the suspension of the solids after phenolation of these lotions.

The very interesting possibility of preparing a concentrate which upon dispersion in water would yield a stable and suitable calamine lotion was then investigated. Calamine and zinc oxide, 8 Gm., each were triturated with quantities of Veegum-HV ranging from 1 to 3 Gm. until a homogeneous mixture resulted. These concentrates were then dispersed in hot water and cold water in order to determine whether or not they would yield a suitable calamine lotion upon dispersion. The concentrates were dispersed with the aid of an electric mixer, three types of which were used, a Mixmaster, a Waring Blendor, and an ordinary malted milk machine. In each case a very stable lotion resulted in which the solids were suspended homogeneously throughout.

The dispersion of the concentrate was accomplished in the following manner: to 85 cc. of distilled water (either just removed from boiling or at room temperature) vigorously agitated by means of an electrically driven stirring device, gradually add the concentrate until all the solids have been uniformly dispersed throughout the water. Then add sufficient distilled water to make 100 cc.

The amount of the concentrate used depended upon the concentration of Veegum-HV in the concentrate. Therefore, with that concentrate containing 2 Gm. of Veegum-HV a total of 18 Gm. of concentrate is used per 100 cc. of lotion. With a desired suspending agent concentration of 3 per cent in the final product, a total of 19 Gm. of concentrate is used per 100 cc. of finished product.

The lotions thus prepared were stored in 100-cc. graduated cylinders and in four-ounce prescription bottles. The latter containers were chosen in an attempt to duplicate storage conditions in the pharmacy and in the home as well as to determine the ability of the lotions prepared to be poured easily from the container in question.

From the data collected, by observing the samples stored, at weekly intervals, the following facts were noted: dispersions of the concentrate in hot water showed less separation of supernatant liquid than those which are prepared by dispersion in cold water. This is well in keeping with the previously known property of Veegum-HV to form a magma of greater viscosity when dispersed in hot water than when dispersed in cold water. The optimum concentration of suspending agent in the final preparations ranges from 2 to 2.5 per cent. With this concentration of suspending agent the maximum degree of separation even in cold water was 12 cc. in a 100-cc. graduated cylinder after a period of three months at room temperature. The stability of the suspensions prepared in the manner noted above is not affected by adding phenol either as crystalline or liquefied phenol. However, some of the phenolated samples did show slight darkening upon standing. Whether this was due to air oxidation or the presence of iron in the Veegum-HV has not been determined.

It would seem that the material presented indicated that calamine lotion can now be produced in a stable form which will not lose its stability after phenolation. In addition, the products thus prepared spread easily and smoothly over the skin and are not prone to rub off on clothing covering the particular area. Lastly and perhaps most important, a simple method for the extemporaneous preparation of calamine lotion has been demonstrated. This proposed concentrate has the added advantage of eliminating the necessity for stock solutions or dispersions of suspending agents and allows a large-scale manufacturer as well as the retail pharmacist a definite saving in storage space.

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A WATER *Dispersible* CALAMINE POWDER

BY E. Celmins,† F. P. Cosgrove,‡ and E. P. Guth§

IN RECENT years considerable interest has been shown in the development of better calamine lotion. While the present official preparation is an improvement over the U.S.P. XIII Lotion, it is not entirely satisfactory to the customer nor to the pharmacist (1). One of the chief complaints of the customer is the difficulty experienced in pouring the Lotion from a prescription bottle. The pharmacist is primarily concerned with the manufacture, in that the present formula does not lend itself to rapid compounding. Also he is concerned with the incompatibility of the Lotion with phenol.

In order to develop a water-dispersible calamine powder to which the pharmacist could extemporaneously add water, or glycerin and water, and compound a stable cream-like lotion, the unique hydrophilic properties of propylene glycol alginate[a] were utilized. This agent disperses the powder quickly because it readily dissolves in hot or cold water and does not require any special soaking, heating, or additional treatment other than simple agitation.

Experimental

Preliminary experiments showed that propylene glycol alginate was an excellent dispersing agent for the powders of calamine lotion, but the resulting lotion could not be easily spread when applied to the skin. After a series of tests using several wetting agents, it was observed that 0.5 per cent of sorbitan monolaurate[b] and 0.8 per cent propylene glycol alginate gave a very satisfactory cream-like lotion which poured readily, spread easily, and dried quickly when applied to both wet and dry skin. Since propylene glycol alginate solutions are subject to bacterial action upon prolonged storage, methyl and propyl parabens were added as preservatives (2).

The water-dispersible calamine powder is prepared according to the following formula:

Calamine	8.00 parts
Zinc oxide	8.00 parts
Propylene glycol alginate	0.80 part
Sorbitan monolaurate	0.50 part
Methyl paraben	0.025 part
Propyl paraben	0.015 part

Directions for Preparation: Incorporate the sorbitan monolaurate with the calamine and sift through a number 80-mesh sieve. Sift the remaining powders separately through a number 80-mesh sieve. Mix the powders thoroughly and sift the mixture through a number 60-mesh sieve. Mix thoroughly again. The mixed powders may be passed through a micropulverizer instead of a sieve if such equipment is available. This mixed powder is used to make calamine lotion by the simple addition of water or glycerin and water.

Directions for Compounding the Lotion: Add 17.34 Gm. of the above powder to enough water or glycerin and water to make 90 cc. Agitate vigorously for approximately three minutes. Finally add a sufficient quantity of water to make 100 cc. Agitate thoroughly again.

The consistency of the finished product can be varied by adjusting the per cent of propylene glycol alginate in the above powder. This may be advisable in either hot or cold climates.

Properties of the Dispering Agent: Propylene glycol alginate is a uniform free-flowing granular powder completely soluble in hot or cold water. Chemically it is a propylene glycol ester of alginic acid. The

(*Continued on next page*)

Authors' Summary

A water-dispersible calamine powder is described which lends itself readily to the extemporaneous preparation of calamine lotion.

A lotion prepared with the powder does not foam or settle readily. It pours rapidly, spreads easily, and dries quickly when applied to either moist or dry skin. It washes off easily with light scrubbing.

The storage test indicates that apparently the new lotion is physically compatible with one per cent phenol at 25° C.

In extreme climates, the consistency of the lotion can be controlled by adjusting the percentage of algin derivative in the powder.

A similar formulation might be made for neocalamine where skin blending is desired.

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a Product of Kelco Company, New York, N.Y.
b Trade mark, Span 20, Atlas Powder Company, Wilmington, Del.

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latter is a hydrophilic colloidal polymer of anhydro β-D-mannuronic acid units. Solutions of the dispersing agent do not react with acids and are fairly resistant to reaction with solutions of heavy metals or alkaline earth salts. Solutions of this algin derivative do not coagulate on heating. There is a decrease in viscosity of approximately 15 per cent with each 10° F. rise in temperature, but this decrease is reversible and the solutions regain the original viscosity when brought to the initial temperature (3).

Discussion

Simple agitation of the powder mixture with water or glycerin and water results in a homogeneous dispersion. The use of the mortar and pestle does not show any advantage over the bottle method for preparing the lotion.

If the phenolated product is desired, adjustment can be made before the lotion is made up to volume. Liquefied phenol is recommended for this purpose.

The phenolated lotion appeared to be physically stable after being stored at 25° C. for 75 days. The plain lotion was stable after 75 days at temperatures of 1.5° C., 25° C., and 40° C. In each case only light shaking was required to produce a lotion with free flowing characteristics.

The lotion stored at 25° C. and 40° C. showed only a slight degree of settling, whereas the preparation stored at 1.5° C. showed no signs of settling.

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Methylcellulose and Polysorbate 80 IN NEOCALAMINE AND ZINC STEARATE SUSPENSION

BY Jerome Cohen,† Glenn Klein,† Kenneth Ross,† and E. P. Guth‡

THE compounding of a satisfactory suspension of insoluble substances such as calamine, neocalamine, zinc oxide, and zinc stearate has been always a difficult process. The incorporation of natural gums or synthetic mucilaginous agents such as methylcellulose will cause the heavy powders to suspend but the preparation is usually too viscous to pour readily and spread evenly. Furthermore, the relatively large quantity of such agents needed results in the formation of films on the body surface. The incorporation of wetting agents with the mucilaginous substances makes it possible to reduce the quantity of suspending agent without affecting the suspending power and at the same time produce a product that will pour easily and spread uniformly. In this work methylcellulose, 1500 c.p.s., and polysorbate 80 (Tween 80) and sorbitan monooleate (Span 80) were used to obtain a satisfactory product.

Basic Formula

Neocalamine	3.6 Gm.
Zinc Stearate	1.0 Gm.
Glycerin	4.0 cc.
Magnesia Magma	10.0 cc.
Methylcellulose (1500 c.p.s.) 3%	30.0 cc.
Water, *q.s. ad*	60.0 cc.

This formula was compounded with varying amounts of polysorbate 80 starting with 0.1 per cent and increasing the percentage by 0.1 per cent through 1.5 per cent. Also the methylcellulose was reduced to a 2 per cent and 1 per cent solution. The reduction of the methylcellulose solution to less than a 3 per cent solution produced a product with unsatisfactory suspending power. However, the 3 per cent methylcellulose solution, while producing a satisfactory suspension, did not dispense well. One-tenth per cent polysorbate 80 added to the formula containing the 3 per cent solution of methylcellulose caused the preparation to pour easily without affecting the suspending power of the methylcellulose. Higher concentration up to 1.5 per cent polysorbate 80 did not produce a better preparation; while the higher concentration of polysorbate caused the preparation to be "oily" when in contact with the skin. One objectionable feature of the polysorbate 80-containing preparation was its foaming property on being shaken or agitated. This foaming characteristic was neutralized by the incorporation of 0.1 per cent sorbitan mono-oleate. The other properties of the preparation were apparently not affected.

The final product had the formula:

Neocalamine	3.6 Gm.
Zinc Stearate	1.0 Gm.
Glycerin	4.0 cc.
Magnesia Magma	10.0 cc.
Methylcellulose (1500 c.p.s.) 3%	30.0 cc.
Polysorbate 80	0.1 cc.
Sorbitan Mono-oleate	0.1 cc.
Water, *q.s. ad*	100.0 cc.

This product is satisfactory in all respects. It stays suspended; it pours easily, spreads evenly, and is easily compounded. The use of methylcellulose, 1500 c.p.s., in combination with polysorbate 80 and sorbitan mono-oleate would seem to offer possibilities in many other types of suspensions that are difficult to compound.

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SORBITAN MONOOLEATE IN *Kaolin Pectin* SUSPENSION

BY Marvin Faeges,† Warren Levitt,† John Lutsch,† and E. P. Guth‡

THE extemporaneous preparation of kaolin and pectin suspensions is a technique not generally performed by the practicing pharmacist since the native properties of the component ingredients seldom yield a satisfactory product. Rapid settling of the kaolin with "caking" usually occurs. If sufficient viscosity is obtained to prevent settling, the product does not pour easily from the container. This work deals with the production of a kaolin-pectin suspension that has desirable characteristics in regard to rate of settling and viscosity. In addition, the results of this study show that the quantity of kaolin can be altered by a comparatively wide margin and still produce a satisfactory product.

Authors' Summary

Kaolin-pectin suspension can be prepared by pharmacists with the usual equipment by the use of sorbitan monooleate. The results of this work show that there apparently is a minimum quantity of sorbitan monooleate that is required to "break" the gel characteristic of pectin when the latter is used in sufficient amounts to suspend the kaolin. This technique suggests the possibility of having a wide variation in the kaolin content of a suspension.

Experimental

After considerable experimentation with suspending agents it was noted that when the proper viscosity was obtained to prevent rapid settling and "caking" of the kaolin, the suspension had jelly-like characteristics. The addition of a small quantity of a surface-active agent, sorbitan monooleate (Span 80), was found to "break" the gel and permit the suspension to flow and at the same time not alter materially the suspending properties of the product.

The formulas shown in box below were compounded.

Formulas A, B, and C all showed rapid settling with "caking" in three to four hours after preparation. Formula B exhibited excessive viscosity and would not pour easily. All could be redispersed on very vigorous shaking.

Formulas D, E, F, and G showed little evidence of settling after three weeks. It is assumed that the kaolin did become more compact at the bottom of the container. However, only gentle agitation of the container was indicated. No evidence of "caking" occurred. All of these formulas poured easily.

Formula H showed evidence of settling shortly after compounding and also was more difficult to pour.

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Formula→	A	B	C	D	E	F	G	H
Kaolin	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Pectin	0.25	0.25	0.5	0.5	0.5	0.5	0.5	0.5
Sorbitan monooleate	0.0	0.0	0.0	2.0	1.0	0.5	0.25	0.1
Water, *q.s.*	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

Polysorbate 80 and Bentonite IN BENZYL BENZOATE LOTION

BY

Theresa Cybulski,†
Robert Fulton,†
Robert Wagner,†
and E. P. Guth‡

BENZYL Benzoate Lotion of the U.S.P. XIV, widely used as a scabicide has certain features that are not entirely satisfactory to the pharmacist since it separates readily on standing. This feature requires that the product be shaken vigorously each time it is used to insure uniform application. Another feature that may be objectionable, but as yet has not been studied, is the alkalinity of the official product, which has a pH of 9.2.

In order to improve the physical properties of Benzyl Benzoate Lotion, a study was made in respect to the use of bentonite as the suspending agent.

Authors' Summary

A new formula for Benzyl Benzoate Lotion has been developed incorporating the use of polysorbate 80 and Bentonite Magma.

The formula possesses the desirable properties of good stability and pharmaceutical elegance.

The formula is easily compounded by the usual equipment found in retail pharmacies.

Experimental

Benzyl Benzoate was mixed with an equal amount of Bentonite Magma in a mortar. This was transferred to a Waring Blendor and the remaining ingredients added in portions until the finished volume of the formula was obtained. This preparation proved to be too viscous and at the same time did not have a good shelf life. The addition of polysorbate 80 (Tween 80) improved the product in two ways. It became less viscous and had a better shelf life. Experiments were then performed to determine the optimum quantities of Bentonite Magma and polysorbate 80 that would produce a satisfactory product.

The table below gives the various amounts of material used.

The formulas were compounded by mixing the Benzyl Benzoate with an equal portion of Bentonite Magma and the polysorbate 80 in a porcelain mortar to form a primary emulsion. This was then transferred to a Waring Blendor and the remaining ingredients were added to make the final volume.

Discussion

Varying amounts of polysorbate 80 and Bentonite were tried, keeping the other ingredients constant. The results indicate that the quantities used in formula "A" resulted in a satisfactory preparation with respect to viscosity and stability. The preparations were subjected to adverse conditions of cold and heat and shelf stability at normal temperature.

This proposed formula (A) combines the scabicide activity of Benzyl Benzoate with the detergent effect of the polysorbate 80 and the adhesive action of the Bentonite, thus insuring good skin contact through efficient adhesion and through reduced surface tension. The calamine adds esthetic value since it closely resembles skin color. The lotion is easily washed off, being an oil in water emulsion. To avoid the undesirable "disinfectant odor," the rose soluble gives a pleasant aroma. This lotion pours easily and can be dispensed in small-mouth bottles. The resulting lotion has a pH of 7.9 which may be desirable as it is less alkaline than the official product.

Formula:	A	B	C	D	E
Benzyl Benzoate	25 Gm.	25 Gm.	25 Gm.	25 Gm.	25 Gm.
Calamine	0.1 Gm.	0.1 Gm.	0.1 Gm.	0.1 Gm.	
Rose Soluble	2 cc.	2 cc.	2 cc.	2 cc.	
Polysorbate 80	2 cc.	4 cc.	4 cc.	2 cc.	
Bentonite Magma	2.5%	2.5%	5%	5%	2.5%
	q.s. 100 cc.	*q.s.* 100 cc.	*q.s.* 100 cc.	*q.s.* 100 cc.	*q.s.* 100 cc.
Results	Good	Too viscous	Too viscous	Separated	Too viscous

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AN INVESTIGATION OF *Lime Water Emulsions*

BY | J. Leon Lichtin† and Aaron Lichtin‡

PART I

EMULSIONS prepared from varying proportions of calcium hydroxide solution (lime water) and olive oil, possibly together with other added ingredients (such as zinc oxide, calamine, phenol, etc.) form a distinct class of dermatological preparations. For brevity, these preparations will be termed lime water emulsions. These oily emulsions, sometimes called "emollient lotions," are therapeutically useful, for example, as an application to the skin after an acute inflammation has been successfully treated with a simple protective lotion, and the skin has become uncomfortably dry. When thus used, the emulsion exerts an emollient and soothing effect (1, 2, 3). These preparations are water-in-oil emulsions in which the emulsifying agent is a calcium soap formed *in situ* by the reaction between the calcium hydroxide in the lime water and the free fatty acids found in the olive oil.

The pharmacist who is occasionally called upon to compound one of the lime water emulsions often finds the task difficult. Further evidence of this is noted in the queries concerning these kinds of preparations which are submitted by pharmacists to the editors of prescription question and answer columns. An investigation has therefore been made to determine the factors responsible for the successful compounding of these preparations and also for the appearance of incompatibilities.

Each of the following factors which were studied in the investigation is listed below. With each factor is a brief summary of the experiments performed together with either the observations or the conclusions drawn therefrom.

I. Olive Oil–Lime Water Volume Ratio

30-cc. portions of olive oil were mixed with the following volumes of lime water: (A) 10 cc.; (B) 15 cc.; (C) 30 cc.; (D) 38 cc.; (E) 45 cc.; (F) 60 cc.; and (G) 90 cc. Preparations (D) and (E) were inferior to (A), (B), and (C), but all five were suitable for dispensing. (F) and (G) did not form emulsions. (A) and (B) containing excess oil, on standing, produced an oil-rich layer. Shaking, however, restored the preparations. (C) on close examination was the most homogeneous.

Conclusions: Equal parts of olive oil and lime water make the best preparation. Any excess of oil, however, can easily be incorporated into the emulsion. The maximum amount of lime water which can be incorporated into the emulsion is certainly not over 1.5 times the volume of the olive oil present. Thus, two volumes of lime water and one volume of olive oil will not produce an emulsion.

II. The Addition of Oleic Acid to an Oil-Deficient Emulsion

Separate 15-cc. portions of olive oil together with 30 cc. of lime water were thoroughly shaken. In no instance did emulsification result. To these separate unemulsified mixtures, the following quantities of oleic acid were added with shaking: (A) 0.05 cc.; (B) 0.1 cc.; (C) 0.2 cc.; (D) 0.5 cc.; and (E) 1.0 cc. (A) produced no emulsion. (D) and (E) were unsatisfactory, being "strained" and overly viscous. (C) was inferior to (B) which was the best of the group. Although (B) made the best preparation, it was inferior (overly viscous) to the emulsion made merely from equal parts of lime water and olive oil.

The same sequence of low volume olive oil emulsions was prepared together with the quantities of oleic acid mentioned above except that the oleic acid was mixed with the olive oil prior to the addition of the lime water. The preparations resulting from this latter series exactly resembled the previous group in which the oleic acid was added to the unemulsified lime water–olive oil mixtures.

To a mixture of 15 cc. olive oil and 30 cc. lime water (unemulsified), oleic acid was added dropwise with shaking from a calibrated dropper. During the addition of the acid, the mixture went through a series of physical changes which closely corresponded to the effects exerted by similar quantities of oleic acid in the two sequences noted previously.

Conclusions: One volume of olive oil and two volumes of lime water will not form an emulsion. The addition of oleic acid to this mixture in judicious quantities (0.1 cc. oleic acid to 15 cc. olive oil and 30 cc. lime water) will produce a not too elegant preparation, but one which may be dispensed. It makes no difference whether the oleic acid is added to the olive oil or to the unemulsified mixture of lime water and olive oil.

III. The Method of Mixing the Olive Oil and the Lime Water

30 cc. of lime water was added to 30 cc. of olive oil, and the mixture was agitated. The experiment was then performed by adding the oil to the lime water. The resulting emulsions were exactly similar.

A set of paired experiments was performed as follows: In each set, three 30-cc. portions of olive oil were used, and to these were added the following

(Continued on next page)

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quantities of lime water: (A) 30 cc.; (B) 35 cc.; and (C) 40 cc. In the first group, the lime water was added, with agitation, in three portions of 10 cc., followed, in (B) and (C), by portions of 5 cc. In the second group, the volumes of lime water used were added all at once to the oil. For equal volumes of lime water used, the addition of the lime water in a single quantity—all at once—produced a superior preparation to the one in which the lime water was added in increments.

Conclusions: Similar products will result if the oil is added to the lime water or if the reverse addition is used. This appears to be true whether the volumes of the two phases are equal or are considerably different from one another. If the volumes of the two ingredients are fairly close to one another, the addition of the lime water all at once to the oil will produce a better product than the addition of the lime water in small increments.

IV. The Effect of Adding Either Ingredient to an Emulsion Previously Prepared from Equal Volumes of Lime Water and Olive Oil

Several portions of an emulsion were prepared in which each portion contained 30 cc. each of lime water and olive oil. To these separate portions, the following were added: (A) 5 cc. of lime water followed by 5 cc. of olive oil; (B) 10 cc. of lime water followed by 10 cc. of olive oil; (C) 15 cc. of lime water followed by 15 cc. of olive oil; and (D) 10 cc. of olive oil. It was noted that the addition of the lime water in (A) through (C) definitely lowered the quality of the emulsions. (C), after the addition of the 15 cc. of lime water, could no longer be dispensed. After the subsequent addition of the olive oil in (A) through (C), all three preparations were restored to almost the same good quality as the original emulsions. Preparation (D) remained excellent. On standing, an oil-rich layer formed. Shaking, however, easily restored the preparation. It was thus noted that (D) behaved like an emulsion which was originally prepared with an excess of oil.

Conclusions: To an emulsion made from equal parts of lime water and olive oil, only a limited amount of lime water can be added. This is equal to about the amount of lime water which would produce a final ratio of 4 volumes of lime water to 3 volumes of olive oil. This ratio, rather than a ratio of 1.5 volumes of lime water to 1.0 volume of olive oil, appears to represent the maximum amount of lime water that can be successfully and safely combined with a given volume of olive oil. An emulsion containing an excess of lime water can be improved by adding an amount of olive oil which would equalize the final volumes of lime water and olive oil. Any lime water emulsion can be safely diluted with oil. This should be kept in mind in rinsing a mortar during the transferring of a lime water emulsion to a bottle.

V. The Effect Produced by Lime Water of Inadequate Strength

To separate 30-cc. portions of olive oil, 30-cc. samples of the following varying strengths of lime water were added: (A) full strength; (B) half strength; (C) quarter strength; and (D) eighth strength. The lower strength solutions were prepared by simple dilution of the lime water with distilled water. (A) produced a good product, but (B) was practically as satisfactory. (C) and (D) were poor and not suitable for dispensing.

Conclusions: The obvious importance of the correct strength of the lime water in these experiments serves to emphasize that lime water should be correctly prepared and stored, and that the pharmacist should be certain of the quality of the lime water prior to using it for any reason.

VI. Incompatibility Tests

On portions of the emulsion made with equal parts of lime water and olive oil, the following incompatibility tests were performed: (A) 2 per cent boric acid dissolved in the lime water; (B) 2 per cent boric acid dispersed in the olive oil; (C) 2 per cent sodium borate dispersed in the olive oil; (D) 1 per cent salicylic acid dissolved in the olive oil; (E) 1 per cent salicylic acid dispersed in the olive oil; and (F) 4 per cent zinc oxide combined with 4 per cent calamine—all dispersed in the olive oil. Preparations (A), (B), (D), and (E) formed no emulsion. (F) was satisfactory. (C) produced a satisfactory product which, however, lasted only 1 to 2 days. By the fourth day it had completely broken down.

Conclusions: Boric acid, sodium borate, and salicylic acid cannot be incorporated in a lime water emulsion. An insoluble, comparatively inert powder as zinc oxide can be suspended in such a vehicle. *Note:* Oleic acid (beyond a critical quantity) cannot be added to a lime water emulsion containing zinc oxide. In a few days a rubbery mass forms in the bottle, produced perhaps because of the formation of zinc oleate.

VII. The Use of Gums or Wool Fat in Preparing the Lime Water Emulsions

It is known that the addition of gums such as tragacanth to these emulsions produces an overly viscous and pharmaceutically unsatisfactory preparation. The addition of wool fat (*secundum artem*) to these preparations is often practiced. The authors feel that in light of the current censure of the presence of hidden wool fat in dermatological preparations, such pharmaceutical practice cannot be recommended. It is for these reasons that no experiments were performed using either the gums or wool fat.

PART II

Because of the several inherent disadvantages of the lime water emulsions, an attempt was made to formulate an emulsion vehicle which could serve as a satisfactory substitute for the emulsion prepared from lime water and olive oil.

The following formula is offered as a substitute vehicle:

Castor oil	50 cc.
Span 80[a]	7 cc.
Tween 80[a] (0.67 per cent solution)	43 cc.
To make about	100 cc.

[a] Supplied by Atlas Powder Company, Wilmington, Del.

Mix the Span 80 with the castor oil in a bottle. To this mixture, add the Tween 80 solution in portions of 3 to 4 cc., agitating strongly after each addition.

This product is white, and much more elegant in appearance than the lime water emulsions. It has an oily emollient feel when spread on the skin. It is stable on the shelf for at least a month. The only change that occurs is a slight creaming. Gentle agitation, however, easily restores the preparation.

This formula was originally developed with olive oil. The olive oil-containing emulsion, however, has several disadvantages which are as follows: Different lots of the emulsion are not always of equal whiteness, and the simple emulsion vehicle is not compatible with as many substances as the suggested castor oil recipe. It is believed that the greater viscosity of the castor oil aids in the high degree of compatibility shown by the suggested product. The odor and the slip upon the skin of the castor oil product appear quite satisfactory.

This castor oil emulsion vehicle is compatible with the following substances:

(1) Salicylic Acid—2 per cent
(2) Boric Acid—2 per cent
(3) Ichthammol—5 per cent
(4) Phenol—1 per cent, and Resorcinol—2 per cent
(5) Zinc Oxide—2 per cent, and Calamine—2 per cent
(6) Water—50 per cent
(7) Alcohol—10 per cent
(8) Aluminum Acetate Solution—10 per cent
(9) Coal Tar Solution—10 per cent

Some creaming occurred in most of the incompatibility tests, but gentle agitation restored the mixtures to their original appearance. The addition of 50 per cent water caused the most creaming, but agitation restored the preparation. This latter preparation, however, contained a final oil concentration of 25 per cent—a low oil content that cannot be carried with the lime water emulsions.

The offered emulsion vehicle is initially compatible with 2 per cent sodium borate, but in 3 to 5 days separates in layers of such composition that agitation does not restore its original bright white color.

The zinc oxide and calamine are quite compatible with the vehicle, but the final preparation does not look very homogeneous.

The method used to perform the compatibility tests was as follows: The ingredients numbered (1) through (5) in the above list and the sodium borate were dispersed in the castor oil using a mortar and pestle. To this was added the Span 80. The mixture was transferred to a bottle and the 0.67 per cent Tween 80 solution was added in 3 to 4-cc. portions with vigorous agitation after each addition. The ingredients numbered (6) through (9) in the above list were added in portions, with agitation, to the previously prepared emulsion vehicle. In all of these tests, a number of cubic centimeters of Tween 80 solution equal to the number of grams (or cc., if liquid) of the added ingredient were subtracted from the formula of the basic emulsion.

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A Veegum-Carbowax MIXTURE AS A MAJOR COMPONENT OF OINTMENT BASES

BY Takashi Kariya, Arnold D. Marcus and Byrl E. Benton

IN VIEW of the striking property of Veegum-HV[a] to form stable, viscous, thixotropic, colloidal dispersions; and the well-known and previously described application of the Carbowaxes[b] to ointment formulation, this investigation was directed toward determining the applicability of a Veegum-Carbowax mixture as a major constituent of ointment bases. In addition, an aqueous dispersion of Veegum-HV alone has been appraised as to its possible value as an ointment base. The Veegum-Carbowax mixture chosen for this investigation consisted of: Veegum HV, 50 per cent, and Carbowax 4000, 50 per cent.

The first portion of this investigation dealt with the formulation of various ointment bases prepared by dispersing the solids in water with agitation. The second phase treated with the preparation of ointments containing commonly used dermatologic medicinal agents and determining the physical and

(*Continued on next page*)

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[a] R. T. Vanderbilt Company, New York, N. Y.
[b] Carbide and Carbon Chemical Company, New York, N. Y.

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chemical compatibility of these substances with the bases in question. Consistency, texture, water separation, and "spreadability" of the final products were considered quite carefully. The concentration of medicament to be incorporated was dictated essentially by the concentration in similar official preparations. As a result of a somewhat tangential study which revealed quite clearly the effect of elevated temperature on the viscosity of Veegum dispersions, the dispersions of the Veegum-HV-Carbowax mixture was accomplished both in water at room temperature (25° C.) and water just removed from boiling (97–99° C.). Other mixtures of Veegum HV and Carbowaxes are being investigated in these laboratories with a view toward determining their applicability.

The following bases have been prepared and tested according to the properties listed above:

1.	Veegum-HV–Carbowax 4000 1:1	20%
	Cold water (25° C.)	80%
2.	Veegum-HV–Carbowax 4000 1:1	20%
	Hot water (97–99° C.)	80%
3.	Veegum-HV–Carbowax 4000 1:1	15%
	Hot water (97–99° C.)	85%
4.	Veegum-HV	8.2%
	Sodium laurylsulfate	0.1%
	Hot water (97–99° C.)	91.7%

The bases described above were prepared in the following manner:

Place the water (either at room temperature or just at boiling) in a container of suitable capacity and agitate vigorously by means of a high-speed electric mixer. Add the mixture of Veegum-HV and Carbowax 4000 in divided (2-Gm.) portions until all of the solids have been incorporated. Continue the agitation for five minutes after all of the solid material has been added to the water.

Base No. 4 was prepared by dissolving the sodium laurylsulfate in the water prior to the addition of the solids. The surface-active agent was used in an attempt to promote the hydration of the solids but the choice of sodium laurylsulfate was purely arbitrary. The presence of the surface-active agent in the violently agitated water causes entrapment of air in the resultant gel and the volume of the base is much greater than if no surfactant is used. Each of the bases prepared was observed for a minimum of four weeks in order to determine any change in viscosity (consistency).

The ingredients chosen for study in these bases were considered primarily because of the frequency of their use in dermatologic practice. It should be made clear at this point that neither these bases nor the ointments prepared are emulsions. Therefore, many of the incompatibilities noted in indigenous emulsions are absent from these preparations. However, White Petrolatum, 5 per cent, has been included as one of the ingredients incorporated into these bases (Tables I–IV). The express purpose of this step was to determine the ability of these bases to emulsify such a substance for use in those instances where emollient effect is particularly desirable.

Authors' Summary

Three ointment bases made by dispersing a mixture of Veegum-HV, 50 per cent, and Carbowax 4000, 50 per cent, in water have been prepared.

One ointment base made by dispersing Veegum-HV in an aqueous solution of sodium laurylsulfate has been prepared.

These four bases have been used to prepare ointments of commonly prescribed dermatologic medicinals.

The resultant ointments have been closely observed for compatibility, consistency, texture, water separation and "spreadability."

Two definite incompatibilities have been uncovered and reported.

These ointment bases are easily prepared and the final ointments prepared from them are very acceptable from a pharmaceutical standpoint.

Additional ointment bases prepared from either Veegum-HV–Carbowax mixtures or Veegum-HV alone are worthy of investigation.

The following ingredients have been incorporated into each of the bases described:

Boric acid, 10 per cent; ammoniated mercury, 5 per cent; coal tar, 5 per cent; yellow mercuric oxide, 1 per cent; zinc oxide, 20 per cent; phenol, 2 per cent; iodine, 4 per cent; benzocaine, 5 per cent; tannic acid, 20 per cent; precipitated sulfur, 15 per cent; calamine, 17 per cent; peru balsam, 5 per cent; sulfathiazole, 5 per cent; benzoic acid, 12 per cent and salicylic acid, 6 per cent (referred to in the tables as "Whitfield's Combination"); and white petrolatum, 5 per cent.

The ointments were prepared in 100-Gm. portions according to the following procedure:

Levigate or mix thoroughly, a small portion of the base with the medicinal agent, in a mortar. Gradually add, with constant trituration, the remainder of the base.

The finished products were stored in two-ounce, emerald green ointment jars which were then tightly closed. These experimental samples were observed

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TABLES I AND II

C—compatible; I—incompatible; G—good; P—poor; E—excellent; SG—slightly gritty; N—none.

BASE NO. 1 ↑ / BASE NO. 2 ↓	Boric Acid, 10%	Ammoniated Mercury, 5%	Coal Tar, 5%	Mercuric Oxide, Yellow 1%	Zinc Oxide, 20%	Phenol, 2%	Iodine, 4%	Benzocaine, 5%	Tannic Acid, 20%	Precipitated Sulfur, 15%	Calamine, 17%	Peru Balsam, 5%	Sulfathiazole, 5%	Whitefield's Combination	Petrolatum, White, 5%
Compatibility	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Consistency	E	E	G	E	G	G	..	E	E	E	E	E	G	E	E
Texture	SG	E	E	E	E	E	..	E	E	G	G	E	E	SG	E
Spreadability	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Separation of water	N	N	N	N	N	N	..	N	N	N	N	N	N	N	N
Boric Acid, 10%	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Ammoniated Mercury, 5%	C	G	E	G	E	E	...	G	E	G	G	E	E	E	E
Coal Tar, 5%	E	E	E	E	E	E	..	E	E	G	G	E	G	SG	E
Mercuric Oxide, Yellow 1%	E	E	E	E	E	E	..	E	P	E	E	E	E	G	E
Zinc Oxide, 20%	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Phenol, 2%	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Iodine, 4%	I	I	I	I	I	I	..	I	I	I	I	I	I	I	I
Benzocaine, 5%	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Tannic Acid, 20%	I	E	E	E	E	E	..	E	E	E	E	E	E	E	E
Precipitated Sulfur, 15%	C	G	E	G	E	E	..	E	P	E	E	E	E	E	E
Calamine, 17%	C	G	E	E	E	E	..	E	P	E	E	E	E	E	E
Peru Balsam, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Sulfathiazole, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Whitefield's Combination	C	E	SG	E	E	E	..	E	P	E	E	E	E	E	E
Petrolatum, White, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Separation of water	N	N	N	N	N	N	..	N	N	N	N	N	N	N	N

C—compatible; I—incompatible; G—good; P—poor; E—excellent; SG—slightly gritty; N—none.

TABLES III AND IV

C—compatible; I—incompatible; G—good; P—poor; E—excellent; SG—slightly gritty; N—none.

BASE NO: 3 ↑ / BASE NO. 4 ↓	Boric Acid, 10%	Ammoniated Mercury, 5%	Coal Tar, 5%	Mercuric Oxide, Yellow, 1%	Zinc Oxide, 20%	Phenol, 2%	Iodine, 4%	Benzocaine, 5%	Tannic Acid, 20%	Precipitated Sulfur, 15%	Calamine, 17%	Peru Balsam, 5%	Sulfathiazole, 5%	Whitfield's Combination	Petrolatum, White, 5%
Compatibility	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Consistency	E	E	E	G	E	G	..	E	E	E	G	E	E	E	E
Texture	E	E	E	E	E	E	..	E	E	E	G	E	G	SG	E
Spreadability	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Separation of water	N	N	N	N	N	N	..	N	N	N	N	N	N	N	N
Boric Acid, 10%	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Ammoniated Mercury, 5%	G	G	E	G	E	G	..	E	E	E	E	E	E	G	E
Coal Tar, 5%	E	E	E	E	E	E	..	E	E	E	E	E	E	Gr	E
Mercuric Oxide, Yellow, 1%	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Zinc Oxide, 20%	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Phenol, 2%	E	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Iodine, 4%	I	I	I	I	I	I	..	I	I	I	I	I	I	I	I
Benzocaine, 5%	C	C	C	C	C	C	I	C	I	C	C	C	C	C	C
Tannic Acid, 20%	I	E	E	E	E	E	..	E	E	E	E	E	E	E	E
Precipitated Sulfur, 15%	C	G	E	G	E	E	..	E	P	E	E	E	E	E	E
Calamine, 17%	C	G	E	E	E	E	..	E	P	E	E	E	E	E	E
Peru Balsam, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Sulfathiazole, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Whitfield's Combination	C	G	E	E	E	E	..	E	P	E	E	E	E	E	E
Petrolatum, White, 5%	C	E	E	E	E	E	..	E	P	E	E	E	E	E	E
Separation of water	N	N	N	N	N	N	..	N	N	N	N	N	N	N	N

C—compatible; I—incompatible; G—good; E—excellent; Gr—gritty; N—none.

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immediately after preparation and at weekly intervals thereafter. It was often noticed that the finished ointments appeared to be rather thin and fluid-like immediately after preparation but upon standing in the containers for from five to fifteen minutes assumed a much greater consistency. This phenomenon may be directly attributed to the thixotropic nature of Veegum.

The data presented in the following tables include observations up to and including a six-week interval after the preparation of the samples. The authors believe that this period of time is indicative of the stability and compatibility of the ointments considered.

Discussion of Experimental Results

Each of the ointments listed (Tables I–IV) is, upon preparation, somewhat thin in terms of consistency. However, the thixotropic properties of Veegum allow for a very quick "setting" of the gel when the ointment is placed in a suitable container. On application to the skin, these ointments spread easily and require almost no force or friction to apply. This, too, may be traced to the thixotropic nature of Veegum.

Attention should be paid here to the physical appearance of the bases themselves. Bases 1 and 2 often exhibit particles of the concentrate which have not been fully hydrated. This appearance may possibly be ascribed to the fact that the amount of water present is not very great in relation to the concentration of solids in the preparation. Therefore, caution should be taken to insure complete hydration of the solids present. During the preparation of the samples from these bases (1 and 2) all of the partially hydrated particles are quickly "rubbed out" and the final ointments exhibit very little or no evidence of unhydrated or partially hydrated particles. Ointment Base No. 4, as noted previously, is of substantially greater volume than the other bases due to the incorporation of air during the comparatively violent agitation of the sodium laurylsulfate solution. This base, as such, appears to have a consistency similar to that of whipped cream and is not entirely acceptable from a standard based solely on physical appearance. However, the ointments prepared with this base were not at all similar to the base itself and possessed a very fine texture and consistency. It seems as though a large portion of the air incorporated into the base is eliminated during the incorporation of the active medicinal ingredient. In terms of appearance, consistency, and texture, Base No. 3 seems to be best when viewed prior to the incorporation of additional substances. The only readily noticeable liability of ointments prepared from these bases is the effect of sometimes drying out on the skin and leaving a flaky residue. This situation is readily corrected by the incorporation of 5 Gm. of propylene glycol in place of 5 Gm. of water.

The samples of boric acid ointment prepared with each of the four bases were exceptionally fine samples. It is difficult to explain the slight grittiness noticed in Table I. This might have been due to the use of crystalline boric acid which had been improperly pulverized or levigated.

The two incompatibilities discovered during the course of this investigation were those with iodine and tannic acid. The former seemingly presents a definite chemical incompatibility which results in complete liquefaction of the ointment and a distinct color change. This sample was prepared according to the official method of dissolving the iodine in a glycerin solution of potassium iodide. The use of water to replace the glycerin did not avert the incompatibility. The second of the two incompatibilities seemed to be purely physical in nature. The tannic acid can be easily incorporated into the base and the resulting ointment is of a particularly fine consistency and texture. However, when this ointment is spread on the skin, it seems to "roll up" in the manner of a massage cream and each of the four samples prepared were equally unsatisfactory from this viewpoint.

One of the most stringent tests which can be made of any ointment base in terms of stability, compatibility and texture is the incorporation of a mixture of benzoic acid, 12 per cent, and salicylic acid, 6 per cent. It is often found that if a particular base is compatible with the mixture, the resultant ointment is granular or gritty to the touch. Although this combination when incorporated into these bases resulted in ointments which were slightly gritty, it is the opinion of the authors that this degree of grittiness is no greater than in samples of Whitfield's ointment which have been extemporaneously prepared. The stability of the bases remained unaltered in the presence of this combination. It was observed quite early in the investigation that those ointments containing salicylic acid turned pink on standing, the depth of the color increasing with time. This undoubtedly was due to the presence of iron in Veegum-HV. It is our opinion that the coloration does not materially affect the therapeutic efficacy of the preparation although the detrimental effect to certain esthetic sensibilities may very well be great.

Peruvian balsam which often offers more than a little difficulty upon incorporation into ointment bases, was incorporated into these bases with remarkable ease. The same can be said of coal tar and precipitated sulfur. The samples containing these ingredients were excellent in every respect.

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A PRELIMINARY STUDY:

The Emulsifying Properties OF CALCIUM URSOLATE

BY Albert M. White† and Donald M. Skauen‡

ALTHOUGH ursolic acid has been known for over 100 years the salts of the acid have received very little attention. Since it is well known that ursolic acid produces water in oil emulsions, the authors assumed that the calcium salt of the acid would also produce water-in-oil emulsions, perhaps with even greater ease.

This preliminary study was made, therefore, for the purpose of determining if calcium ursolate was of value as an emulsifying agent.

Calcium ursolate,[a] with a melting point of 268–270° C., was prepared from the sodium salt using double decomposition. Because of the hydrophobic character of the salt, it was either dissolved in or wetted with the oil phase for formulation purposes.

A comparison between the official Calamine Liniment and one containing varying percentages of calcium ursolate as the emulsifying agent was made. Using 0.05 per cent of the salt in place of the lime water, complete separation occurred; while 0.1 per cent and 0.5 per cent produced satisfactory emulsions. The results appear in Table I.

Replacing the lime water in Lime Liniment N.F. VIII with 0.3 per cent calcium ursolate resulted in a product inferior to the official preparation. Increasing the concentration of the salt to 0.5 per cent made a liniment comparable to the official product.

Acetic Turpentine Liniment N.F. VIII was prepared using 0.3 per cent calcium ursolate in place of egg. Only slight separation was noted after a 24-hour period. No separation was observed after 24 hours when the salt was increased to 0.5 per cent.

In order to further prove the potential emulsifying power of calcium ursolate, four emulsions, Cod Liver Oil Emulsion N.F. IX, Castor Oil Emulsion R.B. II, Oil of Turpentine Emulsion N.F. VIII, and Liquid Petrolatum Emulsion U.S.P. XIV, were prepared using calcium ursolate in place of the specified emulsifying agent. Even though these emulsions are of the water-in-oil type as prepared with calcium ursolate and hence not acceptable for internal medications, the very low concentrations of the salt required to produce stable emulsions indicates that a strong emulsifying agent has been prepared. The percentages of calcium ursolate employed and the results are tabulated in Table I.

Table I.
Concentrations of Calcium Ursolate Used for Emulsions

Preparation	Percentage of Calcium Ursolate	Results after 24-Hr. Period
Calamine Liniment N.F. IX	0.05	Complete separation
Calamine Liniment N.F. IX	0.1	No separation
Calamine Liniment N.F. IX	0.5	No separation
Lime Liniment N.F. VIII	0.3	Complete separation
Lime Liniment N.F. VIII	0.5	Slight separation
Acetic Turpentine Liniment N.F. VIII	0.3	Slight separation
Acetic Turpentine Liniment N.F. VIII	0.5	No separation
Cod Liver Oil Emulsion N.F. IX	0.3	Slight separation
Cod Liver Oil Emulsion N.F. IX	0.75	Slight separation
Cod Liver Oil Emulsion N.F. IX	1.5	No separation
Castor Oil Emulsion R.B. II	0.5	Slight separation
Castor Oil Emulsion R.B. II	1.0	Heavy liquid
Castor Oil Emulsion R.B. II	1.5	Semisolid
Turpentine Oil Emulsion N.F. VIII	0.01	Slight separation
Turpentine Oil Emulsion N.F. VIII	0.1	Heavy liquid
Turpentine Oil Emulsion N.F. VIII	0.5	Semisolid
Liquid Petrolatum Emulsion U.S.P. IX	0.3	Complete separation
Liquid Petrolatum Emulsion U.S.P. IX	0.5	Slight separation
Liquid Petrolatum Emulsion U.S.P. IX	1.0	Slight creaming

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[a] The ursolic acid used in the preparation of calcium ursolate was furnished by the National Cranberry Association, Hanson, Mass.

Hydroxyethyl Starches AS SUSPENDING AGENTS

BY Dale H. Cronk† and Louis C. Zopf‡

Authors' Summary

Hydroxyethyl starch CWS exhibits potentialities as a suspending agent in the compounding of dermatologic lotions.

Hydroxyethyl starch CWS was found to be superior to the HWS variety both from the standpoint of compatibility and suspending properties.

The compatibility of hydroxyethyl starch CWS with alcohol indicates its value as a suspending agent in the field of dermatologic pharmaceuticals.

Methylparaben 0.25 per cent is a satisfactory preservative for hydroxyethyl starch CWS hydrosols.

A 5 per cent concentration of hydroxyethyl starch CWS appears to be the optimum for most lotions requiring the use of a suspending agent.

COMPREHENSIVE STUDIES of a number of types of synthetic suspending agents have been written up in the literature. Nadkarni and Zopf (1) in a study of some of the newer synthetic agents with calamine lotion have found that polyethylene glycol 400 monostearate exhibited good suspending properties, and a similar formula is now official in the *United States Pharmacopeia*, fourteenth revision (2). deNavarre and Koehler (3) have made a study of both synthetic agents and natural gums as to their suspending properties with various concentrations of suspending agents being used. Their study was made from the cosmetic point of view and included use of such pigments as zinc oxide, titanium dioxide, etc.

This investigation is concerned with the use of a modified starch, namely the hydroxyethyl starches produced on an experimental basis by and supplied through the courtesy of Carbide and Carbon Chemicals Company, a Division of the Union Carbide and Carbon Corporation. The exact process of manufacture is not known to the authors, but it is known that these experimental starches are produced by the reaction of ethylene oxide with corn starch. The cold water soluble hydroxyethyl starch[a] contains about 50 per cent by weight of ethylene oxide and the hot water soluble hydroxyethyl starch[b] contains about 30 per cent by weight of ethylene oxide.

Experimental

The purpose of this study was to determine the compatibilities and suspending properties of the hydroxyethyl starches when used with the various vehicles and pigments frequently employed as therapeutic agents. The insoluble powders (pigments) may be classified as hydrophilic and hydrophobic (4). This study included both types of powders.

The quantity of the various lotions prepared ranged from 60 ml. to 3785 ml. (one gallon). The wide range of quantities prepared is an important part of this study since quantity prepared and technique of preparation is of vital importance to the stability

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[a] Hydroxyethyl starch, cold water soluble, hereafter referred to as hydroxyethyl starch CWS.

[b] Hydroxyethyl starch, hot water soluble, hereafter referred to as hydroxyethyl starch HWS.

TABLE I.—SUSPENSION STUDIES

Lotion		Per Cent Suspension
1. Sulfur Lotion (control)		
Precipitated sulfur	10.0%	
Starch U.S.P.	3.0%	75% 24 hours
Distilled water, *q.s*	100.0%	42% 8 days
2. Sulfur Lotion		
Precipitated sulfur	10.0%	
Hydroxyethyl starch HWS	3.0%	100% 24 hours
Distilled water, *q.s*	100.0%	98% 8 days
3. Sulfur Lotion		
Precipitated sulfur	10.0%	
Hydroxyethyl starch CWS	4.0%	100% 24 hours
Polyethylene glycol 400	6.0%	100% 8 days
Distilled water, *q.s*	100.0%	
4. Sulfur lotion		
Precipitated sulfur	10.0%	
Hydroxyethyl starch CWS	6.0%	
Isopropyl alcohol	10.0%	100% 24 hours
Perfume, *q.s.*		100% 8 days
Distilled water, *q.s*	100.0%	
5. Zinc Oxide Lotion		
Zinc Oxide	10.0%	
Polyethylene glycol 400	5.0%	100% 24 hours
Hydroxyethyl starch CWS	5.0%	100% 8 days
Distilled water, *q.s*	100.0%	
6. Zinc Oxide Lotion		
Zinc Oxide	10.0%	
Alcohol 95%	35.0%	
Polyethylene glycol 400	4.0%	100% 24 hours
Hydroxyethyl starch CWS	3.0%	100% 8 days
Distilled water, *q.s*	100.0%	
7. Calamine Lotion (Modified)		
Calamine	8.0%	
Zinc Oxide	8.0%	
Polyethylene glycol 400	8.0%	100% 24 hours
Hydroxyethyl starch CWS	3.0%	100% 8 days
Distilled water, *q.s*	100.0%	
8. Phenolated Calamine Lotion (Modified)		
Calamine	8.0%	
Zinc Oxide	8.0%	
Polyethylene glycol 400	8.0%	100% 24 hours
Hydroxyethyl starch CWS	3.0%	100% 8 days
Liquefied phenol	1.0%	
Distilled water, *q.s*	100.0%	
9. Acne Lotion (Modified) Univ. of Iowa Hospitals Formulary		
Sodium Borate	1.36%	
Calamine	6.25%	
Starch U.S.P.	6.25%	
Resorcinol	3.00%	100% 24 hours
Hydroxyethyl starch CWS	5.00%	100% 8 days
Alcohol 95%	70.50%	
Distilled water, *q.s*	100.00%	
10. Ammoniated-Mercury-Salicyclic Acid Lotion		
Ammoniated Mercury	3.0%	
Salicylic Acid	3.0%	100% 24 hours
Hydroxyethyl starch CWS	4.0%	100% 8 days
Distilled water, *q.s*	100.0%	
11. Drying Lotion (Modified) Jeff. Med. College Hospital Formulary		
Zinc Oxide	16.6%	
Talc	16.6%	
Glycerin	12.5%	100% 24 hours
Distilled water	29.0%	90% 8 days
Hydroxyethyl starch CWS	2.0%	
Alcohol 95%, *q.s*	100.0%	

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and appearance of the finished lotion. A variety of lotions have been prepared using both aqueous and hydroalcoholic media since most dermatologic lotions currently in use consist of those media together with various types of pigments.

Cold water and hot water soluble hydroxyethyl starches were the suspending agents used in this study. Corn starch U.S.P. was used as a control.

Methods of Preparation

Hydroxyethyl starch HWS..... 3.0%
Precipitated sulfur..... 10.0%
Distilled water, *q.s.*.....100.0%

Hydroxyethyl starch HWS is placed in a beaker, the required amount of distilled water added and heat applied to effect a sol. The sol is then cooled to room temperature. The sulfur is placed in the mortar and the prepared vehicle gradually added with constant trituration to insure a uniform suspension. The control, using a corn starch sol as the suspending medium for a 10 per cent sulfur lotion, was prepared in a similar manner.

Two general processes have been employed in preparing hydroxyethyl starch CWS sols. One method is to place the hydroxyethyl starch CWS in the distilled water and effect a sol by frequent agitation during a 12-hour period. In the second method the sol is prepared extemporaneously by mixing the hydroxyethyl starch CWS with the other powders in the mortar while compounding the lotion, the water then being added in portions with trituration following each addition to effect a uniform dispersion.

HYDROXYETHYL STARCH CWS LOTIONS TESTED

Zinc Oxide Lotion

Zinc Oxide..... 10.0%
Hydroxyethyl starch CWS..... 5.0%
Polyethylene glycol 400..... 5.0%
Distilled water, *q.s.*.....100.0%

The zinc oxide and hydroxyethyl starch CWS are mixed in a mortar, the glycol is then added and triturated with the powders until a uniform paste results. The water is added in small portions while

TABLE II.—COMPATIBILITY STUDIES

Sol Tested	Alcohol 95%	Polyethylene Glycol 400	Glycerin
I. 10 ml. 3% starch U.S.P.			complete miscibility
Sample 1.	1 ml. (cloudy)		
Sample 2.	4 ml. (complete precipitation)		
Sample 1.		1 ml. (cloudy)	
Sample 2.		1.5 ml. (complete precipitation)	
II. 10 ml. 3% hydroxyethyl starch HWS	complete miscibility		complete miscibility
Sample 1.		3 ml. (cloudy)	
Sample 2.		6 ml. (complete precipitation)	
III. 10 ml. 3% hydroxyethyl starch CWS	complete miscibility	complete miscibility	complete miscibility

TABLE III.—VISCOSITY STUDIES[c]

Sol Tested	Viscosity in Centipoise
5% Hydroxyethyl starch CWS hydrosol w/w	346
5% Hydroxyethyl starch CWS hydrosol with 10% glycerin w/w	776
5% Hydroxyethyl starch CWS hydrosol with 10% polyethylene glycol 400 w/w	494
5% Hydroxyethyl starch CWS hydrosol with 10% propylene glycol w/w	547
5% Hydroxyethyl starch CWS hydrosol with 20% alcohol w/w	591
5% Hydroxyethyl starch CWS hydrosol with 40% alcohol w/w	590
5% Hydroxyethyl starch CWS hydrosol with 1% phenol w/w	614
5% Hydroxyethyl starch CWS hydrosol with 5% resorcinol w/w	117
5% Hydroxyethyl starch CWS alcosol in 95% ethanol	75

[c] Readings made with Hoeppler Viscosimeter.

TABLE IV.—pH STUDIES.[d] HYDROXYETHYL STARCH CWS

Sol Tested	pH
1. 5% Hydroxyethyl starch CWS hydrosol	6.50
2. Sulfur lotion with 4% hydroxyethyl starch CWS	6.85
3. Calamine lotion with 3% hydroxyethyl starch CWS	
Sample 1 with phenol	7.82
Sample 2 without phenol	7.73
4. 5% Hydroxyethyl starch CWS hydrosol with 1% phenol	6.22
5. 1% Phenol in distilled water	6.05
6. 5% Hydroxyethyl starch CWS hydrosol with 5% resorcinol	6.15
7. 5% Resorcinol in distilled water	5.52
8. 5% Hydroxyethyl starch CWS with 5% salicylic acid	3.42
9. 5% Salicylic acid suspended in distilled water	2.85
10. 5% Hydroxyethyl starch CWS hydrosol with 40% alcohol	7.15
11. 40% Alcoholic solution	7.48

[d] Readings made with a Beckman pH meter.

continuing the trituration until a homogeneous lotion results.

Sulfur Lotion

Precipitated sulfur	10.0%
Hydroxyethyl starch CWS	4.0%
Polyethylene glycol 400	6.0%
Distilled water, *q.s*	100.0%

Method I

The hydroxyethyl starch CWS is added to the water and agitated periodically for 12 hours to effect a sol. The sulfur and glycol are triturated together in a mortar until the sulfur is thoroughly wetted and the hydroxyethyl starch CWS sol is then gradually added with continuous trituration until a uniform suspension is attained.

Method II

The sulfur and the hydroxyethyl starch CWS are placed in a mortar and triturated together until uniformly mixed, the glycol is added and trituration continued until the powders are thoroughly wetted. Finally the water is added in very small portions with continuous trituration until the lotion is homogeneous.

Calamine Lotion (Modified)

Calamine	8.0%
Zinc Oxide	8.0%
Polyethylene glycol 400	8.0%
Hydroxyethyl starch CWS	3.0%
Distilled water, *q.s*	100.0%

The pigments and the hydroxyethyl starch CWS are thoroughly mixed in a mortar, the glycol is added and triturated with the powders until a smooth paste results. The water is added in small portions with continuous trituration until a homogeneous lotion results. This lotion differs from U.S.P. Calamine Lotion only in the suspending agent used.

Ammoniated Mercury-Salicyclic Acid Lotion

Ammoniated mercury	3.0%
Salicyclic acid, powdered	3.0%
Hydroxyethyl starch CWS	4.0%
Distilled water, *q.s*	100.0%

The hydroxyethyl starch CWS is added to the distilled water and a sol effected by frequent agitation for a 12-hour period. The sol is then gradually added to the powders in the mortar while continuing the trituration until a uniformly suspended lotion is attained.

Acne Lotion (Modified)

State University of Iowa Hospitals Formulary

Sodium Borate	1.36%
Calamine	6.25%
Starch U.S.P.	6.25%
Resorcinol	3.00%
Hydroxyethyl starch CWS	5.00%
Alcohol 95%	70.50%
Distilled water, *q.s*	100.00%

The hydroxyethyl starch CWS is placed in the alcohol and frequently agitated during a period of 12 hours to effect a sol. The sodium borate is dissolved in the water with the aid of heat. The resorcinol is dissolved in the sol. The calamine and starch are mixed in a mortar, then the alcohol-starch-resorcinol sol is gradually incorporated and thoroughly triturated until the powders are uniformly suspended. Finally the cooled solution of sodium borate is added and tituration is continued until the lotion is homogeneous.

Drying Lotion (Modified)

Jefferson Medical College Hospital Formulary

Zinc Oxide	16.6%
Talc	16.6%
Glycerin	12.5%
Water	29.0%
Hydroxyethyl starch CWS	2.0%
Alcohol 95%, *q.s*	100.0%

The hydroxyethyl starch CWS and the required amount of alcohol are placed in a flask or other suitable container and a sol effected by frequent agitation for a period of 12 hours. The zinc oxide and talc are mixed in a mortar, the glycerin is added and triturated with the powders to form a smooth paste. The water is added and the mixture triturated until uniform. Finally the prepared sol is added and trituration continued until the lotion is homogeneous.

Discussion

In general the results of the suspension studies were determined by allowing the various lotions to stand undisturbed while observations were made at varying time intervals. Results are recorded in Table I.

Hydroxyethyl starch CWS was found to be superior to the HWS variety because of its greater range of compatibilities (see Table II) and its superior suspending properties, hence this paper deals largely with the CWS variety.

The sulfur lotion prepared with the 3 per cent corn starch sol (control) confirmed the established fact that corn starch is not a good suspending agent.

It was observed when preparing the various sulfur lotions that the levigating agent used was an important factor in determining the particle size of the sulfur in the finished lotion. Polyethylene glycol 400 produced a very fine subdivision of sulfur particles and the finished lotion had a smooth, creamy appearance. When alcohol, 95 per cent, was used as a levigating agent, the resulting sulfur particles in the finished lotion were much larger.

Viscosity studies were made using aqueous and hydroalcoholic sols of hydroxyethyl starch CWS. Tests were made 96 hours after preparation of the sols. The reason for the time interval was to permit the escape of air which had been incorporated with the product during preparation. It was found that a hydroalcoholic medium increased the viscosity of the sols as compared with an aqueous medium. There appears to be an optimum concentration of alcohol which will cause the maximum amount of swelling of the hydroxyethyl starch CWS. Results recorded in Table III show that between 40 per cent and 95 per cent concentration there is a sharp drop in viscosity.

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During the course of experimentation, pH readings were taken; and in making these pH studies, the vehicle used was a 5 per cent hydroxyethyl starch CWS sol which contained such other ingredients as phenol, resorcinol, and salicylic acid. Readings were also taken using aqueous solutions of these agents as controls. Results are recorded in Table IV. When phenol, resorcinol, and salicylic acid were incorporated with a 10 per cent sulfur lotion, the suspending properties of hydroxyethyl starch CWS were markedly reduced, however, the difference in pH failed to solve the problem. Time did not permit verification of these results.

Hydroxyethyl starch CWS hydrosols will support mold growth and such growth has been observed within a 10-day period. A similar sol was prepared using 0.25 per cent methylparaben as a preservative, which proved very effective in the prevention of any mold growth.

Dry hydroxyethyl starch CWS cannot be satisfactorily dispersed by trituration with water unless some other powder is incorporated which will serve to coat the starch particles and thereby prevent clumping upon the addition of water.

These lotions when passed through a high-speed colloid mill lose their suspending properties since a considerable quantity of air is incorporated with the product, and a reduction in viscosity results.

Isopropyl alcohol and a commercial brand of rubbing alcohol compound were used in preparing 10 per cent sulfur lotions containing hydroxyethyl starch CWS as the suspending agent. Of the two tested, isopropyl alcohol would be the better substitute for ethanol from the standpoint of finer texture and from the per cent of suspension achieved. However, due to its disagreeable odor, some type of perfume should be added.

The acne lotion (modified) included in this study differs from the *University of Iowa Hospitals Formulary* Acne Lotion only in that hydroxyethyl starch CWS has been added as a suspending agent for the pigments. Excellent results have been achieved with use of a 5 per cent concentration of the suspending agent (see Table I), and the finished lotion has a uniform appearance.

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SOME PHARMACEUTICAL USES OF *Hectorite*

BY Abraham H. Matalon† and E. P. Guth‡

THE possible use of hectorite in pharmacy was suggested by the unique physical properties of this mineral. Since the work of Guth, *et al.* (1, 2) on bentonite had brought out some new aspects of the use of natural silicates in pharmacy, it was considered worth while to investigate this material for use as an ointment base, emulsifying agent, and suspending agent.

Hectorite is a white clay which swells rapidly when placed in water and soon becomes a gelatinous mass which, after twenty-four hours, is a firm jelly estimated to be ten to fifteen times the volume of the original clay.

Large deposits of hectorite are found in Hector, San Bernadino County, and Amargosa Valley, California. It is also found in parts of Canada, Sweden, and Scotland. Its chemical composition is somewhat variable depending on its source. However, these variations are considered minor as they affect the physical properties of the clay very little.

Composition of Hectorite

The analysis of hectorite by several investigators shows some variation in composition. Table I shows the analysis as found by Foshag, Stevens, and

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Eyrich respectively:

TABLE I.

	Per cent by Foshag	Per cent by Stevens	Per Cent by Eyrich
SiO_2	53.68	55.86	59.97
Al_2O_3	0.60	0.13	0.49
CaO	0.52	Trace	0.45
MgO	25.34	25.03	27.46
Na_2O	3.0	2.68	2.73
K_2O	0.07	0.10	....
Li_2O	1.12	1.05	....
Fe_2O_3	....	0.03	0.026
F	....	5.96	5.35
H_2O +	8.25	9.90	....
H_2O	7.28	2.24	....
Cl	0.31	....	....
Loss on ignition	....	....	4.00
	100.16	102.98	100.276
		0 = F = 2.51	
	100.16	100.47	100.276

Ross and Hendricks (3) describe hectorite as 16 $MgO \cdot Li_2O \cdot 24SiO_2 \cdot 6(F \cdot H_2O)(Na_2O)$. The almost total absence of Al_2O_3, the presence of essential Li_2O, and the dominance of fluorine over hydroxy seem to establish the Hector clay as a distinct mineral species.

From Foshag's analysis it is evident that this clay is essentially a magnesium silicate with only an insignificant amount of aluminum present. Noteworthy is the high sodium content of 1.12 per cent. The proposed formula according to Foshag's analysis is: $7MgO \cdot 10SiO_2 \cdot 5H_2O$.

M. H. Hey (4) places it in the Montmorillonite family of the clay group. He found many other synonyms for the substance: Hectorite (of Strese and Hofmann), magnesium bentonite, magnesium beidellite. Hectorite therefore may have the formula of $Mg_2Si_3O_8 \cdot 3\ H_2O$ or $Mg_7Si_{10}O_{27} \cdot 5\ H_2O$ or $Mg_3Si_4O_{10}(OH)_2$ with some replacement of magnesium by lithium together with an exchangeable cation up to about $Li_{0.33}$ and some replacement of hydroxy groups by fluorine. Other analyses show neither lithium nor fluorine, whether by oversight or by variation in the mineral is uncertain. The exact composition of hectorite is therefore still undetermined.

As a result of a series of experiments concerning the properties of hectorite as these were related to pH adjustment and physical characteristics of gels with varying percentages of hectorite the following pharmaceutical studies were made.

Hectorite as an Ointment Base

In order to compare hectorite ointment base with others the following ointment bases were prepared:

I. U.S.P. XIV White Ointment Base:
White wax..... 5 Gm.
White petrolatum *q.s.*.....100 Gm.

II. U.S.P. XIV Polyethylene Glycol Ointment Base:
Polyethylene glycol 400..... 50 Gm.
Polyethylene glycol 4000 *q.s.*.....100 Gm.

III. Hectorite..... 6 Gm.
0.1 *N* HCl[a]..... 10 cc.
Clark and Lubs' buffer pH 3.2[b] *q.s.*
.....100 cc.

IV. Hectorite..... 7 Gm.
Glycerin..... 10 cc.
0.1 *N* HCl..... 10 cc.
Clark and Lubs' buffer pH 3.2 *q.s.*
.....100 cc.

V. Hectorite..... 7 Gm.
Glycerin..... 20 cc.
0.1 *N* HCl..... 10 cc.
Clark and Lubs' buffer pH 3.2 *q.s.*
.....100 cc.

VI. Hectorite..... 15 Gm.
Mineral oil.....250 cc.
0.1 *N* HCl..... 2 cc.
Clark and Lubs' buffer pH 5.4 *q.s.*
.....500 cc.

VII. Hectorite..... 40 Gm.
Cottonseed oil.....100 cc.
0.1 *N* HCl..... 5 cc.
Clark and Lubs' buffer pH 5.4 *q.s.*
.....500 cc.

In each of the above bases the following were incorporated: 5 per cent ammoniated mercury, 10 per cent boric acid, 2 per cent phenol, 10 per cent sulfathiazole, and 4 per cent iodine plus 4 per cent potassium iodide. Bactericidal activity of the above ointments was tested according to the modified agar cup method inhibition zone. Staphylococcus aureus strain 209 was used as the test organism.

After two months ammoniated mercury oint-

(*Continued on next page*)

[a] 0.1 *N* HCl was necessary to eliminate carbonates from the gel.
[b] Clark and Lubs' buffers were made double strength to maintain the pH of the hectorite base.

Authors' Summary

Hectorite is a naturally occurring white magnesium silicon hydrate of slightly variable composition.

Hectorite swells rapidly on hydration to produce gels that can be mixed with glycerin or oils to form ointment bases. The aqueous gels can be used as dispersing agents in lotions.

Hydrochloric acid is added in the gel formation to remove carbonates, and the ointment products are buffered.

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ments, where hectorite was used as part of the base, became light yellow.

The iodine in base VII was very light brown, probably due to the chemical combination of the iodine with the unsaturated fatty acids in the oil present in the base.

Determination of the pH[d] of the above-mentioned drugs incorporated in bases II, IV, and V showed minor changes of the pH over three weeks.

[d] Beckman model G pH meter.

Discussion

Hectorite has certain properties such as its rapid swelling on hydration and its white color that are advantageous over bentonite. Bentonite, because of its brown or tan color and slow hydration, is frequently difficult to use. Although hectorite has not been accepted or recognized in the U.S.P. or N.F., it

TABLE II.
Width of Zone of Inhibition in Millimeters Produced by the Prepared Ointments

Ammoniated Mercury in Bases	Inhibition Zone	Phenol in Bases	Inhibition Zone
I	1.5	I	0.0
II	10.0	II	5.5
III	15.0	III	8.0
IV	19.0	IV	11.0
V	18.0	V	10.0
VI	12.0	VI	13.0
VII	12.0	VII	12.0

Boric Acid in Bases	Inhibition Zone	Sulfathiazole in Bases	Inhibition Zone
I	0.0	I	0.0
II	7.0	II	9.0
III	12.0	III	12.5
IV	14.0	IV	4.0
V	13.0	V	3.0
VI	15.0	VI	4.5 (partial 12)
VII	15.0	VII	3.0 (partial 12)

Bases	Inhibition Zone	Iodine[e] In Base	Inhibition Zone
I	0.0	I	0.0
II	1.5		
III	...	II to VII iodine volatilized out of the base and spread throughout the petri dish, and no growth was observed.	
IV	4.0		
V	3.5		
VI	0.0		
VII	0.0		

[e] Glycerin was used to dissolve the iodine-potassium iodide mixture.

TABLE III.
Changes in the pH of the Ointments

Ammoniated Mercury in Base	3 Days	21 Days	Phenol in Base	3 Days	21 Days	Iodine in Base	3 Days	21 Days
III	5.9	6.1	III	4.8	5.2	III	4.7	4.9
IV	5.5	5.6	IV	4.5	4.9	IV	4.6	4.8
V	5.4	5.6	V	4.6	4.9	V	4.5	4.8

Boric Acid in Base	3 Days	21 Days	Sulfathiazole in Base	3 Days	21 Days
III	4.8	5.0	III	4.9	5.2
IV	4.2	4.8	IV	4.5	4.8
V	4.4	4.7	V	4.6	4.9

has been widely used in the cosmetic industry, usually as a component of a preparation intended to act as a dispersing agent or plasticizer. Since hectorite has been shown by analysis to be free from lead and to have an arsenic content less than the official upper limits for arsenic in natural drugs, it is believed that hectorite would be a valuable addition to pharmaceutical aids. It can be used to produce satisfactory suspensions and ointments. Although it is not reported in this work, hectorite was found to be a fair emulsifier.

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(2) Barr, M., and Guth, E. P., THIS JOURNAL 31: 646 (1950).
(3) Ross, S., and Hendricks, S. B., "U. S. Geol. Survey, Professional papers 205-B," U. S. Government Printing Office, Washington (1945).
(4) Hey, M. H., *An Index of Mineral Species and Varieties*, p. 87, Jounold and Sons, Ltd., Norwich, England, 1950.

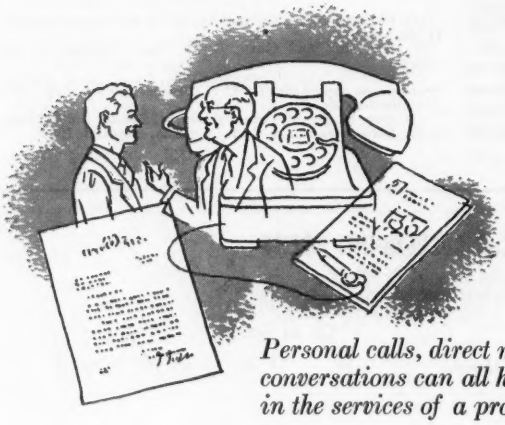
HECTORITE AS A SUSPENDING AGENT

The following suspensions were prepared and their rate of settling recorded:

		Cc. of Settling				
		15 min.	1 hr.	24 hr.	48 hr.	96 hr.
Precipitated sulfur	5 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	3.0	3.0	3.0	4.0
Precipitated sulfur	5 Gm.					
Hectorite	1 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	0.0	0.5	0.5
Precipitated sulfur	10 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	1.5	1.5	1.5
Bismuth subnitrate	5 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	3.0	3.0	3.0
Bismuth subnitrate	5 Gm.					
Hectorite	1 Gm.					
0.1 *N* HCl	5 cc.					
Distilled Water *q.s.*	50 cc.	0.0	0.0	0.5	0.5	0.5
Bismuth subnitrate	10 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	7.0	14.0	18.0	18.0	19.0
Sulfathiazole	5 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	1.5	8.0	12.0	12.5	12.5
Sulfathiazole	5 Gm.					
Hectorite	1 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	0.5	0.5	0.5
Sulfathiazole	10 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	0.5	0.5	0.5
Calamine	4 Gm.					
Zinc Oxide	4 Gm.					
Hectorite	1 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	0.0	0.0	0.0	0.0
Calamine	4 Gm.					
Zinc Oxide	4 Gm.					
Hectorite	0.5 Gm.					
0.1 *N* HCl	5 cc.					
Distilled water *q.s.*	50 cc.	0.0	1.0	4.5	5.0	7.0

No "caking" occurred in any of the suspensions during the period of study.

CONTACT WITH PHYSICIANS



Increases Professional Prestige

Personal calls, direct mail letters, and telephone conversations can all heighten physicians' interest in the services of a professional pharmacy.

WITHIN the past decade, the increase in the prescribing of pharmaceutical specialties has been phenomenal. This increase has brought numerous changes in the operation of the average pharmacy, added materially to inventories, increased "deadstock" and broadened the scope of the pharmacist's service to the physician. Unfortunately, many pharmacists have not adjusted as well as they should to these changes.

The growth of pharmaceutical specialties has been the result of research, primarily, and intensive sales effort, secondarily. The flood of direct mail to physicians goes on unabated; detail men are constantly being hired, trained, and sent into the field; medical journal advertising has never been greater. Yet, in all but a few notable instances, the pharmacist has not been as quick to support his professional services with a promotional campaign of his own to the physician. Where pharmacists have instituted promotional programs by direct mail and detailing to the physician, they have quickly captured the position of the community's leading professional pharmacy.

One effective method that can be employed, inexpensively, by the pharmacist, is a continuing direct mail program to physicians and other prescribers. To assist pharmacists in starting such a program, the three letters on the opposite page have been prepared. They are offered here as examples of some ideas that can be keyed to the individual's particular pharmacy, community and professional position. Each of the three letters touches on a different phase of a pharmacist's professional service, either in compounding, complete stocking of new pharmaceuticals, or as a reference library for the medical profession. Letters can also be written on other phases of prescription service, packaging, completeness of the sick room supplies department of the pharmacy, or telephone and delivery services. In any case, the letters should carry some message that is pointed, *and particular*, to the services the pharmacy can render.

Direct mail is not the only method of contacting the physician. Successful programs have been developed around a regularly scheduled series of detail calls, wherein the pharmacist represents his services, just as the manufacturer's detail man represents his firm. Often times, in the physician's mind, "local availability" means far more than "national availability." If he knows the newer items are available in his own community, he will write his prescriptions with the assurance that the patient will be able to begin taking the medication as soon as possible. Moreover, it avoids call-backs and other delays that cut into his valuable time.

Today's professional pharmacy is in no sense less professional because such a promotional campaign is instituted. Rather does the pharmacy gain in stature, as more and more physicians are made aware of the broadened professional services. Doctors, faced with keeping records of new pharmaceuticals and new techniques, have come to expect the pharmacist to supply this information. Thus, a promotional campaign of the type outlined here is expected, and effective.

Dear Doctor:

Within the past several years, research specialists in pharmacy have investigated the potentialities of several new substances as dermatologic vehicles. In a great many instances, these new additives have resulted in more elegant pharmaceutical preparations, whether they be lotions or ointments. They have the further advantage of increasing stability; their water solubility or water miscibility offer greater patient satisfaction.

We have followed these research reports with interest here in our pharmacy, and have prepared several commonly used prescriptions, employing these new emulsifiers and surfactants in the bases. We would be most happy to show these prescriptions to you at your convenience, either in your own office or in our prescription laboratory.

We shall take the liberty of telephoning tomorrow to confirm any appointment period you select. We feel confident that you will find these modernly compounded preparations of extreme interest, since they offer many therapeutic advantages and opportunity for supplying your own selection of drugs in unusually elegant form.

Very truly yours,
Russell P. Russell
Russell Pharmacy

Dear Doctor:

As you know, compounding of dermatologic prescriptions is one of the most important aspects of present-day pharmacy. Many of the prescriptions written today require individual compounding, since they call for the incorporation of a variety of medicinals which are effective only when incorporated in specially prepared bases. Compounding of such prescriptions, utilizing all the newest techniques and materials, has been one of the outstanding professional services of our pharmacy.

However, we have also placed special emphasis on stocking those preparations which are marketed for distinct dermatological conditions. We are prepared to fill your prescriptions for not only the newest specialties, but for the old, long-recognized products as well.

In addition to this physical preparedness, our pharmacists are also ready to answer any questions you may have with respect to the name, indications, and composition of any of the many new dermatologic specialties introduced. We appreciate the fact that your crowded schedule, plus the multitude of these products, places a burden on your time, and we are ready to relieve you of that burden if you will consider us as a ready source of product information. Naturally, our product-listing files are always available to you if you wish to use them as a personal source of reference.

Very truly yours,
Russell P. Russell
Russell Pharmacy

Dear Doctor:

The other day a local physician called concerning the correct name of a new specialty. He had spent considerable time looking for the literature before he called us. We quickly found not only the name, but the indications, dosage, administration and other pertinent information and read it to him over the telephone.

Later, it occurred to us that perhaps other physicians are devoting valuable hours to fruitless searching after names. If the problem is one that you and your staff have been facing lately, with the great flood of specialty products being marketed, won't you call on us? Of course, we cannot guarantee success in every instance, but it is entirely probable that our complete new-product files will supply most of the answers.

When next you are in our neighborhood, won't you stop in and examine our information-filing system? We are most anxious to make it of greatest value to the physicians of the community, and your suggestions will be deeply appreciated.

Very truly yours,
Russell P. Russell
Russell Pharmacy

Some Pharmacological Aspect

The Pharmacist and Community Mental Health

BY R. H. FELIX, M. D.

THE PHARMACIST...

A KEY CITIZEN IN MENTAL HEALTH

In this concluding article in his series on the present-day aspects of mental health, Dr. Felix reviews the progress that medicine is making in the treatment of mental disorders. In the two previous installments, published in the March and April issues of THIS JOURNAL, *he stated the importance of the problem, and the role that the pharmacist can play in reducing the incidence of mental illness in the United States.*

A SURVEY of research supported by the Public Health Service in the still difficult-to-define field of mental illness has brought to light a number of interesting facts. The problems which have received the most extensive support to date were, in the following order, research into etiology, symptomatology, and pathology of mental illness; development and evaluation of treatment methods; normal child development; studies of the nervous system; and the relation of environmental stress to mental health and mental illness. This means that a great deal of attention was paid to research which dealt directly or indirectly with recognized psychiatric disorders, and somewhat less to investigations of how human beings can best and most harmoniously adjust to the exigencies of living. On the other hand, the possibilities of new paths which can be opened up by "basic" research projects (although they may appear to have no immediate bearing on any one specific problem) are not being neglected.

Of interest to pharmacologists was a breakdown of this survey by methodology. This indicated that research projects utilizing biological, chemical, or pharmacological approaches were about midway on the list, and were topped in number only by projects with psychological and social science approaches. Projects involving study of psychiatric treatment methods and those utilizing inter-disciplinary research, probably because of the inherent difficulties in designing this type of approach, fell somewhat below the other two classifications.

In the middle category, however, a number of absorbing studies are presently being carried on throughout the country.

The now familiar drugs ACTH and cortisone are still receiving marked attention in the re-

* Director, National Institute of Mental Health, National Institutes of Health, Public Health Service, U. S. Department of Health, Education, and Welfare.

f Mental Health Research

search field and the etiological role which they may play in mental illness has by no means been fully explored.

ACTH and Cortisone

One current study of the effects of these drugs on physiology and behavior involves a systematic investigation of their action on adaptive responses, using the rhesus monkey as the experimental animal. The fact that psychological changes in patients have been noted in connection with the administration of ACTH and cortisone indicates a need for detailed examination of these phenomena. The investigators will attempt to answer such questions as whether, and to what extent, these drugs affect the ability to learn and retain knowledge involving problems of discernment, social interaction and dominance, and the formation of conditioned emotional responses and conflicting habit systems. At the same time, efforts will be made to correlate alterations in behavior with biochemical changes such as are involved in electrolyte balance and certain aspects of metabolism.

Another group of investigators is studying adrenocortical function in schizophrenia, and the relation of disturbed emotional states and electroshock to the state of activity in the adrenal cortex. A "normal" response to a specific dosage of ACTH has been defined for use in comparing the response of patients diagnosed as chronic schizophrenics to the same dosage. Certain basic facts about the possible physiological variations in the 17-hydroxycorticosterone (Compound F) levels in the blood must be determined so that the necessary psychiatric controls can be established. It is hoped that from this study, medicine and psychiatry may be furnished with a new weapon to combat this widespread yet still little understood form of mental disorder.

New Type of Shock Therapy

A new type of shock therapy, known as photic stimulatory therapy, has been developed for use with psychiatric patients and its use is being evaluated. Convulsive shock treatment is among the commonest short-term successful physical therapies for the severely disturbed mental patient. It has been in almost daily use throughout the country for over ten years. However, no appropriate method of studying the exact physical effect of such treatment on the human brain has been developed. This study may permit continuous electroencephalographic recording and quantitative measurement of the changes in the brain waves induced during convulsive therapy, a method heretofore found impractical with the use of electroshock. Other such studies are also aimed at extending the basic information we now have on the activity of the brain itself in the hope of developing new therapeutic approaches to mental illness.

In research on therapy, an attempt is being made to correlate data obtained from doctor-patient psychiatric interview procedures, mechanical recordings of the effect of direct electrical stimulation of the brain, and observable biochemical changes. If the theoretical assumptions upon which this research is based can be established, the results may bring about further and even more significant advances in our ability to cope with schizophrenia, as well as with certain other disease processes which are now known to be affected by alterations in steroid metabolism.

The Biochemistry of Mental Processes

A recently begun research project presents an excellent entry point for study of the biochemistry of mental processes. This will attempt to determine whether the mental defect known as phenylketonuria (phenylperuvic oligophrenia) results from (1) some toxic substance, detrimental to normal functioning of nervous tissue, which is formed and accumulated in the body, or (2) whether some enzyme or coenzyme, also necessary to nervous tissue metabolism, is missing. If the theory of either a toxic substance or a "missing" substance could be established, it is conceivable that diets might be constructed

(*Continued on page 326*)

THE EBERT PRIZE

1874–1952

One of the objectives of the AMERICAN PHARMACEUTICAL ASSOCIATION has been to stimulate progress in the sciences basic and directly related to the practice of pharmacy. To accomplish this objective in the early days of the ASSOCIATION, special committees were appointed to draw up in advance of each convention a list of topics on which scientific and professional data were lacking. Many members of the ASSOCIATION prepared papers on these topics, based on original investigations and various types of research.

Exactly 100 years ago (1853) the AMERICAN PHARMACEUTICAL ASSOCIATION through its Executive Committee proposed to "offer annually, prizes for the determination of questions deeply interwoven with the practice or science of pharmacy, and thus elicit valuable accessions to existing knowledge." In 1854, a Committee on Prizes established two prizes as follows: twenty-three volumes of the *American Journal of Pharmacy* for "the best essay which shall develop the commercial history of all drugs indigenous to the United States," and six volumes of *Gmelin's Hand Book of Chemistry* for "the best essay on the question—do Hyoscyamus, Belladonna and Conium grown in the United States contain their active principles in the same proportion as the European grown plants?"

Since then, many significant prize awards have been established by or through the AMERICAN PHARMACEUTICAL ASSOCIATION, including a General Association Award; the Hermann Hager Memorial Prize; the John M. Maisch Prize; the Frederick B. Kilmer Award; and the Remington Honor Medal. None, however, have continued in existence nearly as long, nor do they represent achievement in scientific pharmaceutical research as completely as the Ebert Award.

On September 17, 1873, Secretary John M. Maisch of the AMERICAN PHARMACEUTICAL ASSOCIATION read the following communication from Albert E. Ebert, the retiring president of the ASSOCIATION:

> September 12th, 1873
>
> Gentlemen: To further original investigation and to inaugurate a system of prizes by the ASSOCIATION, to those who by study and application, shall add to our knowledge of medicinal substances, I have the pleasure to present to this ASSOCIATION the inclosed sum, five hundred dollars . . . .
>
> Respectfully,
> ALBERT E. EBERT

Albert Ethelbert Ebert lived to see sixteen of these awards bestowed upon worthy recipients before his death in Chicago on November 20, 1906. Ebert was born in Germany on December 23, 1840, and came to this country with his parents in 1841. He attended the Chicago College of Pharmacy (1859) and subsequently graduated from the Philadelphia College of Pharmacy (1864). The Ph.D. degree was conferred upon him by the University of Munich in 1867.

Ebert entered the retail practice of pharmacy in Chicago in 1868. He became editor of *The Pharmacist* of Chicago the same year and was appointed Professor of Pharmacy at the Chicago College of Pharmacy in 1871. In 1872, he was elected president of the AMERICAN PHARMACEUTICAL ASSOCIATION.

The distinguished list of recipients of the Ebert Prize since its establishment indicates the importance which this award has acquired in American pharmacy. The list of recipients, with the types of the contributions for which the award was given, is published below.

1874—CHARLES MITCHELL (Philadelphia, Pa.) "On Active Principles of the Official Veratrums."

1877—FREDERICK B. POWER (Washington, D. C.) "On the Resins of the Rhizome of Podophyllum Peltatum."

1882—JOHN URI LLOYD (Cincinnati, Ohio) "Precipitates in Fluid Extracts."

1886—EMLEN PAINTER (San Francisco, Calif.) "Spirit of Nitrous Ether."

1887—EDWARD KREMERS (Madison, Wisc.) "Volatile Oils Hedeema Pulegioides and Andropogon Nardus."

1888—JOSEPH GEISLER (New York, N. Y.) "Notes on the Morphiometric Assay of Opium."

1890—WILLIAM T. WENZELL (San Francisco, Calif.) "Coloring Principles of Flowers."

1891—JOHN URI LLOYD (Cincinnati, Ohio) "A Scheme of Assaying."

1896—JAMES W. T. KNOX and ALBERT B PRESCOTT (Ann Arbor, Mich.) "The Caffeine Compounds of Kola."

1897—VIRGIL COBLENTZ (New York, N. Y.) "Gelsemic Acid."

1898—HENRY KRAEMER (Philadelphia, Pa.) "Quantitative Examination of Crude Drugs."

1899—EDWARD KREMERS and OSWALD SCHREINER (Madison, Wisc.) "Nitroso Derivatives of Caryophylline and Cadinene and the Bearing on the Characterization and Classification of the Sesquiterpenes."

1902—J. O. SCHLOTTERBECK and H. C. WATKINS (Ann Arbor, Mich.) "Contribution to the Chemistry of Stylophorum Diphyllum."

1903—FREDERICK B. POWER (Washington, D. C.) "The Chemistry of the Stem of Derris Uliginosa."

1905—ERNEST SCHMIDT (University of Marburg, Germany) "Concerning Chlorine, Neurine and Allied Compounds."

1906—J. O. SCHLOTTERBECK and H. C. WATKINS (Ann Arbor, Mich.) "Contributions to the Chemistry of Chelidone."

1907—FREDERICK B. POWER and FRANK TUTIN (Washington, D. C.) "A Chemical Examination of Eriodictyon."

1908—A. B. STEVENS and L. E. WARREN (Ann Arbor, Mich.) "Poison Sumach."

1909—HENRY KRAEMER (Philadelphia, Pa.) "Some of the Distinguishing Morphological Characters of Belladonna and Scopolia."

1910—HARRY M. GORDIN (Chicago, Ill.) "The Crystalline Alkaloid of Calycanthus Glaucus."

1911—W. A. PUCKNER and L. E. WARREN (Chicago, Ill.) "The Composition of Strychnine Arsenate and the Composition of Commercial Copper Citrate."

1915—E. N. GATHERCOAL (Chicago, Ill.) "The Pharmacognosy of the Medicinal Rhamnus Barks."

1916—JOHN URI LLOYD (Cincinnati, Ohio) "Absorption Powders of Hydrated Siliceous Earths."

1919—ARNO VIEHOEVER, C. O. EWING and J. F. CLEVENGER (Washington, D. C.) "Some Commercial Viburnum Barks and Preparations."

1920—GEORGE D. BEAL (Chicago, Ill.) "Immiscible Solvents in Connection with Their Uses in Alkaloidal Assaying."

1921—ALBERT SCHNEIDER (Lincoln, Nebraska) "Micro-Analytical Methods."

1922—W. L. SCOVILLE (Detroit, Mich.) "Hot Extraction of Drugs."

1923—PAUL S. PITTENGER (Philadelphia, Pa.) "The Biological Standardization of Local Anesthetics," and "Isolated Uterus Assay for Pituitary Extract."

1924—H. V. ARNY (New York, N. Y.) "Standardized Color Fluids."

1925—H. W. YOUNGKEN (Boston, Mass.) "The Anatomy and Botanical Position of Mire."

1926—J. A. HANDY and L. F. HOYT (Buffalo, N. Y.) "Diethylphthalate."

1927—L. W. ROWE (Detroit, Mich.) "Colorimetric Assay of Digitalis."

1928—E. E. SWANSON (Indianapolis, Ind.) "Standardization of Digitalis Preparations, Nux Vomica, Gelsemium and Veratrum. Hydrogen Ion Concentration Factor."

1929—JOHN C. KRANTZ, JR. (Baltimore, Md.) "The Buffer Capacities of Acacia and Tragacanth."

1930—M. R. THOMPSON (Baltimore, Md.) "The Pharmacology of Ergot."

1931—H. W. YOUNGKEN (Boston, Mass.) "The Pharmacognosy and the Pharmacology of Viburnum."

1932—ZDENEK F. KLAN (Praha, Czechoslovakia) "Influence of Period of Vegetation and Development of Plants on the Alkaloidal Content of Hyoscyamus Niger."

1933—EWIN GILLIS and H. A. LANGENHAN (Seattle, Wash.) "A Phytochemical Study of Hydrastic Canadensis."

1935—MARVIN J. ANDREWS (Baltimore, Md.) "Determination of the Reasonable Permissible Margin of Error in Dispensing."

1936—GLENN L. JENKINS and CHARLES F. BRUENING (Baltimore, Md.) "The Assay of Syrups Containing Hypophosphites Official in the National Formulary."

1938—FREDERICK F. JOHNSON (Seattle, Wash. "Solubility and Hydrogen Ion Concentration of Quinine Salts."

1939—B. V. CHRISTENSEN and L. G. GRAMLING (Gainesville, Fla.) "Biological Assay of Gelsemium."

1941—WILLIAM J. HUSA (Gainesville, Fla.) A series of 23 papers entitled "Drug Extraction" published between 1934 and 1940.

1945—PAUL JANNKE and HOWARD JENSEN (Lincoln, Nebr.) "Sclerosing Agents—Sodium Morrhuate."

1946—LLOYD W. HAZLETON and KATHLEEN D. TALBERT (Washington, D. C.) "Factors Influencing the Cathartic Activity of Senna in Mice."

1947—WALTER H. HARTUNG (Baltimore, Md.) A series of 15 papers on the synthesis of "Amino Acids" and "Aminoalcohols."

1948—HARRY W. HIND and FRANK M. GOYAN (San Francisco, Calif.) "A New Concept of the Role of Hydrogen Ion Concentration and Buffer Systems in the Preparation of Ophthalmic Solutions."

1949—ROBERT PRATT, JEAN DUFRENOY, PETER P. T. SAH and LOUIS A. STRAIT (San Francisco, Calif.) "Enhancement of Penicillin Activity *in vitro* by Vitamin K_5" and "Enhancement of Penicillin Effectiveness by Traces of Cobalt."

1950—RUDOLPH H. BLYTHE, HARLAN H. TUTHILL and JOHN J. GULESICH (Philadelphia, Pa.) "Evaluation of Hydrophilic Properties of Bulk Laxatives Including the New Agent Sodium Carboxymethylcellulose."

1951—LOUIS W. BUSSE and TAKERU HIGUCHI (Madison, Wisc.) "Studies on Pharmaceutical Powders and the State of Subdivision" and "Heat Sterilization of Thermally Labile Solutions."

1952—LLOYD W. PARKS, ARNOLD J. HENNIG and TAKERU HIGUCHI (Madison, Wisc.) "Sabadilla Alkaloids III. Isolation of a New Crystalline Alkaloid, Sabatine."

FROM THE SECRETARY'S DIARY FOR APRIL

1st Among today's visitors we welcomed Mrs. C. Herbert Packard, widow of Past-President Packard, whose pharmacy in Boston was a landmark for many years and whose contributions to the profession in Massachusetts, as well as nationally, were outstanding.

2nd A pleasant visit with President R. Q. Richards who was on his way back to Florida with Mrs. Richards from the A.P.M.A. meeting at White Sulphur Springs, and stopped to discuss pending ASSOCIATION affairs and view the building and grounds, since he is also chairman of the Committee on Property and Funds.

6th Last Saturday a long conference with President-Elect Franzoni reviewing convention speaking assignments, national defense problems, and relations with other professional groups. Today at the Biltmore Hotel in New York for the meeting of the American Foundation for Pharmaceutical Education and returning to Washington on the Congressional with Retiring President H. A. B. Dunning of the Foundation, who made significant contributions to its progress in the year just ended.

9th These past three days in and out of the meetings dealing with the future of the World Health Organization and its support by the citizenry. Much ado at the office in connection with plans for the Salt Lake City Convention, the telephone being kept busy by contacts with committee chairmen and others concerned with the meeting program.

15th A large part of this day spent with the architects going over every phase of our building and learning that in twenty years there is some movement even by the marble slabs. Such things as roofs, stone steps, interiors, plumbing, et cetera, do show the stress and strain of the passage of time, but, on the whole, our structure has fared very well, even though larger sums have to be set aside each year for repairs and upkeep. In the afternoon to the Lee High School to take part in a vocational conference with special attention to the students who wish to enter pharmacy.

18th Last Thursday a visit from Dean Bliven's George Washington University College of Pharmacy students, and yesterday getting the sad news from the stone masons that repairs recommended by the architects will cost in the neighborhood of $5,000, although all of the work is not immediately necessary. Today a visit to Fredericksburg with George Griffenhagen, going over affairs at the Hugh Mercer Apothecary Shop with the Board of Managers of Friends of Historical Pharmacy. Here William B. F. Cole, Esquire, was elected president to succeed William T. Allen.

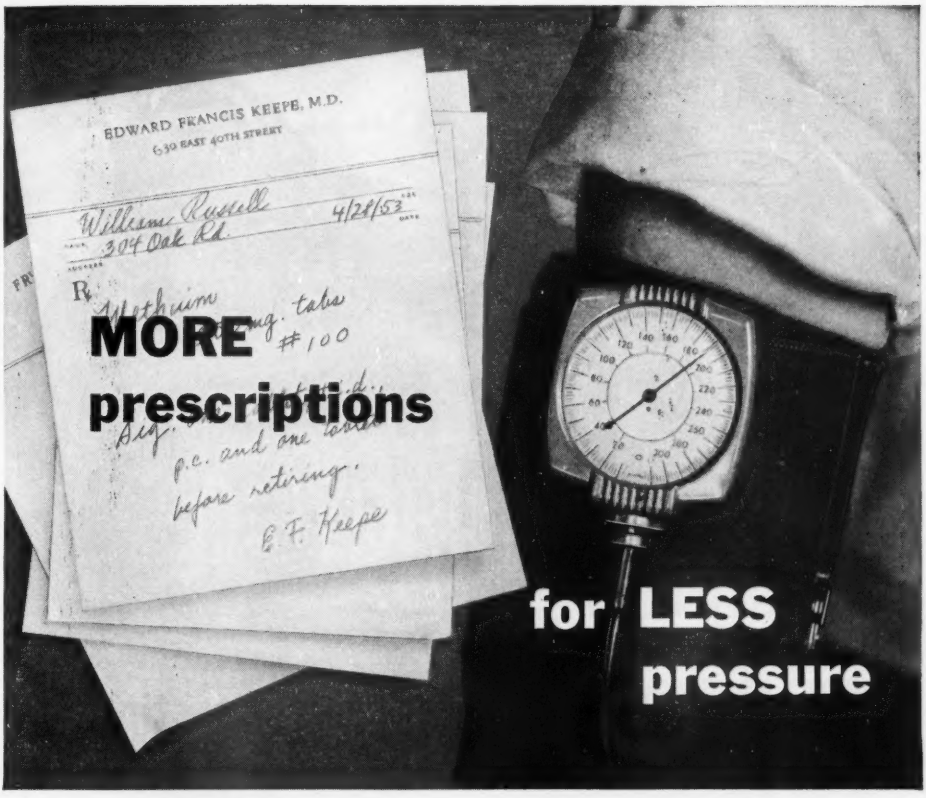
21st Glad to welcome Mr. and Mrs. Walter Chase who were visiting in Washington to enable Walter to attend the meeting of the Committee on Public Relations, which was short two prominent members due to George Archambault's need for emergency surgery and Bert Mull's temporary indisposition. However, J. W. Lansdowne proved to be a good pinch-hitter for Bert and the committee completed plans for National Pharmacy Week observance.

22nd A long conference with Dr. John Gorrell who is acting as special consultant to the Census Bureau on hospital pharmacy statistics. It looks as though the special projects which the Census Bureau may develop in this field can be of great help to hospital pharmacists.

25th A part of last Thursday spent in Baltimore with Treasurer Schaefer transferring A.PH.A. bond investments from one category to another as authorized by the Council and in the afternoon conferring with State Department officials in Washington on generic names for drugs.

27th Failure of the Congress of the United States to pass legislation permitting the District of Columbia to go on daylight saving time has created a chaotic situation here in connection with transportation. This evening viewing some of the scientific exhibits arranged at the National Institutes of Health and paying a visit to the pharmacy layout at the new Clinical Center at Bethesda, with pharmacist Skolaut showing us where things are and expected to be.

30th Last Tuesday evening listening to a splendid address by John Krantz before the Washington Torch Club, in which we can now claim membership. Today with daylight saving time finally in force, by the grace of Congress, Washington becomes more regular in its contacts with the outside world. Today attending some of the sessions of the Committee on National Formulary here, and also conferring with Messrs. Kazin, Monday and Allen on the content of the panel discussion which will consider what the professions expect of each other, at the Rutgers Conference on May 13.



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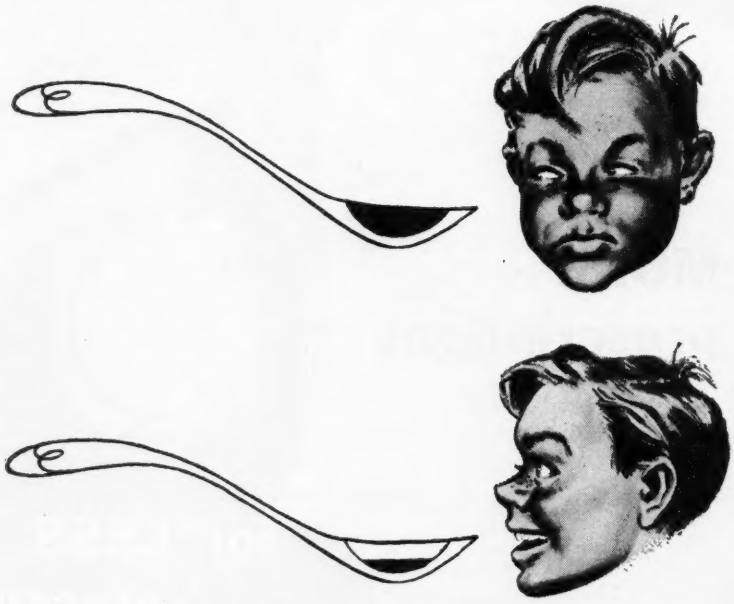
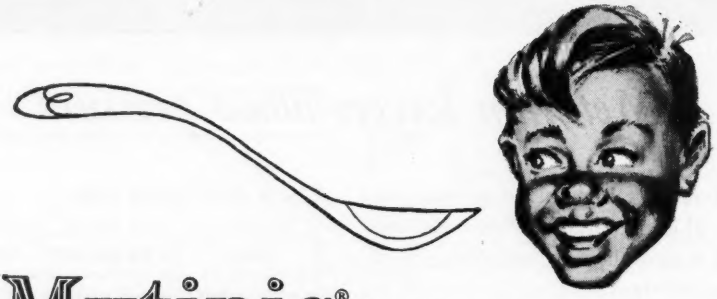


when "The proof of the pudding is in the . . ." **tasting**



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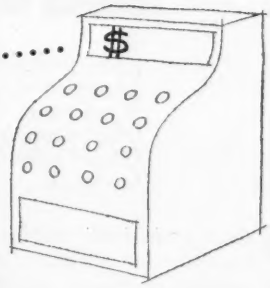

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Three Important Pharmaceutical Meetings Scheduled for the Months of August and September

The forthcoming convention of the American Pharmaceutical Association, August 16–23; The British Pharmaceutical Conference, August 31–September 4; and the International Pharmaceutical Federation meeting in Paris, September 13–20, focus world-wide attention on pharmaceutical problems and progress.

THREE professional meetings of world-wide importance to pharmacy are scheduled for the months of August and September. The AMERICAN PHARMACEUTICAL ASSOCIATION, ushering in its 101st year, will hold its 1953 convention in Salt Lake City, Utah, the week of August 16. Two weeks later, the 90th British Pharmaceutical Conference will convene in London, and close September 4, allowing delegates and interested pharmacists sufficient time to reach Paris for the 15th General Assembly of the International Pharmaceutical Federation, opening in the Palais de Chaillot on September 13.

The great international participation in the Centennial Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, held in Philadelphia in August, 1952, assures increased American participation at the forthcoming conventions in London and Paris. Moreover, transportation plans have been made so that American pharmacists can attend the Salt Lake City meeting and still have sufficient time to reach London for the opening of the British Conference, August 31. Arrangements now being completed call for a group of Americans to leave New York for London on August 29, by plane. It is expected that a sizable delegation will be present at both the London and Paris assemblies.

World-Wide Representation

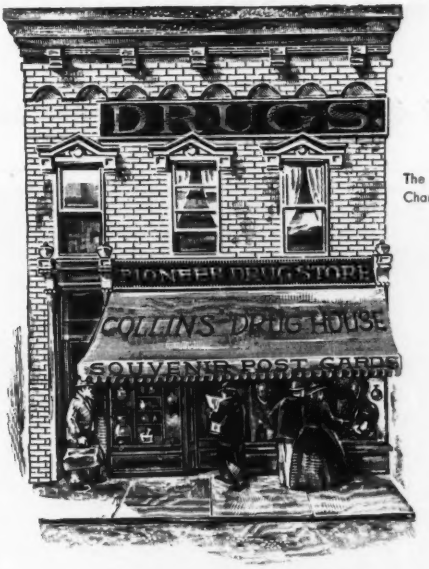
The International Pharmaceutical Federation is composed of 32 national pharmaceutical associations representing 24 countries. The AMERICAN PHARMACEUTICAL ASSOCIATION officially represents American pharmacy as an "ordinary member" of the Federation. Individuals are classified as "associate members," and at present, more than 100 Americans hold such membership in the international body. The A.PH.A. is represented by eight official voting delegates, the maximum number allowed any association. The number of delegates is apportioned according to the size of the member-association's organization.

The International Pharmaceutical Federation was created in 1910, with headquarters in The Hague. The first assembly met in The Hague in 1912, and the assembly has met at two-year intervals since that time, except during war periods. The last meeting was held in Rome, in September, 1951, and was attended by Dr. Don E. Francke, then president of the A.PH.A., Dean Charles F. Poe, of the College of Pharmacy of the University of Colorado, and Norbert Wegemer, hospital pharmacist of Petoskey, Mich., as official representatives of the ASSOCIATION. Following that meeting, Dr. Francke wrote, "I look forward to seeing a delegation of from 30 to 50 Americans in Paris in 1953." Early interest indicates that this expectation may be realized.

The program of the Federation is similar to that of the A.PH.A., with General Assemblies being devoted to problems of over-all concern, and smaller meetings devoted to specialized fields of interest. Prior to this forthcoming meeting, the only section of the Federation has been the Scientific Section, but numerous other groups have met in unofficial sessions. It is expected that this year, in Paris, these other groups will be officially recognized and given the designation of Sections. These groups include directors of control laboratories, pharmaceutical editors, hospital pharmacists, pharmaceutical historians, and military pharmacists.

Tentative A.PH.A. Program to Be Announced

The tentative program for the Salt Lake City meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be published in the next issue of THIS JOURNAL. In the meantime, letters and the Hotel Reservation Form have been mailed to every member of the ASSOCIATION apprising them of the initial plans for this important meeting, marking as it does the beginning of the second century of organized pharmacy in America. Members of the ASSOCIATION are urged to mail their Hotel Reservation Forms early to assure accommodations for the meeting. Current indications are that the convention will be extremely well attended, and that the program will be crowded with papers of intense interest to pharmacists in all segments of the profession.



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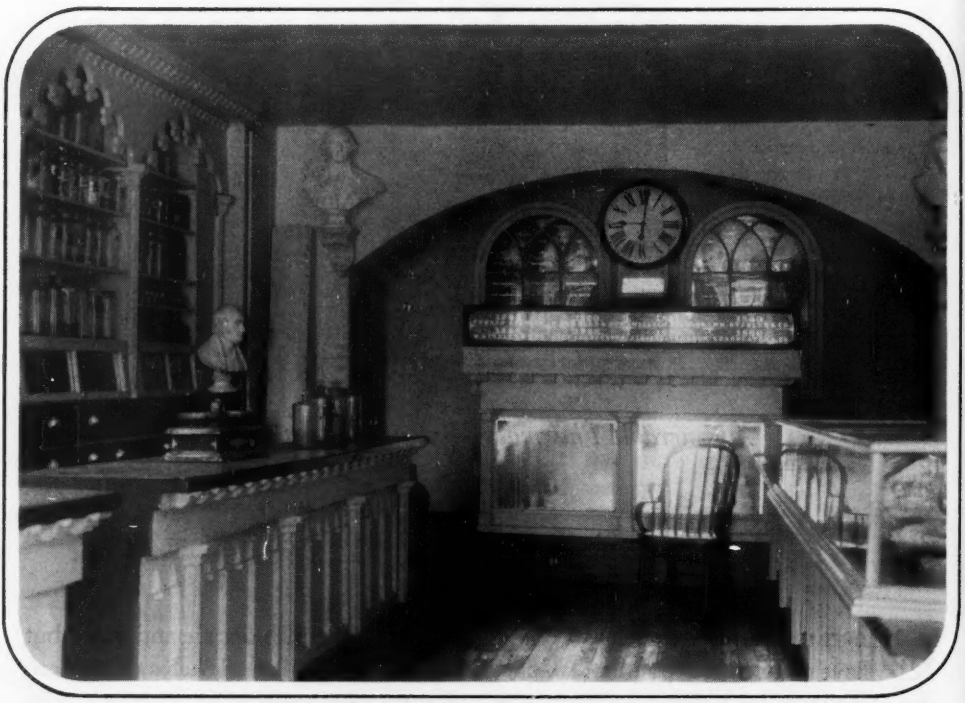

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History: Edward Stabler opened this apothecary shop in 1792 on its present site, the corner of King and Fairfax Streets, Alexandria. The ownership of the firm remained in the Stabler-Leadbeater family for the succeeding 141 years. Upon the death of Edward S. Leadbeater in 1933 the building and fixtures were auctioned off going to the Landmark's Society of Alexandria through the assistance of members of the AMERICAN PHARMACEUTICAL ASSOCIATION. The shop was opened for exhibition in 1940.
Description: The front of the shop displays rounded show windows on each side of the entrance. The interior exhibits Gothic arcades along each side with original worn shelves of hand-blown bottles. At the rear of the shop is a large desk upon which is lettered in gold leaf the names under which the business operated from 1792 to 1865. On the front counter is a plaque commemorating the exact spot where Robert E. Lee received orders to proceed to Harpers Ferry to apprehend John Brown. Documents on exhibition include several orders from the Washington family at Mount Vernon.
References: J. AM. PHARM. ASSOC., **22:** 705 (1933). *Ibid.*, **23:** 1137 (1934). *Ibid., Practical Ed.*, **3:** 216 (1942). *American Druggist*, **117:** No. 5, 75 (1948). *Travel*, **91:** 22 (Oct., 1948).

* Associate Curator, Division of Medicine and Public Health, Smithsonian Institution, Washington, D.C., and Consultant to the A.PH.A. Museum. The second of a series of monographs describing apothecary shop restorations on exhibition in the United States.

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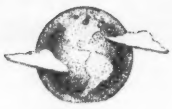


WORLD MEDICAL ASSOCIATION HOLDS FIRST WESTERN HEMISPHERE MEETING

Major advances in medicine over the past 75 years were reviewed by leading scientists and physicians at the first Western Hemisphere Conference of the World Medical Association in Richmond, Va., April 23–25. The development of asepsis in surgery, knowledge of the hormones of the glands of internal secretion, the knowledge of the relationship of contaminated food to infant mortality, and psychoanalytic techniques led the list. Each of the men participating on the program reviewed past progress in their various specialty fields.

The Conference, made possible through a grant from the A. H. Robins Company of Richmond, attracted physicians from every state and 21 foreign countries. The World Medical Association is a private, independent organization of 43 national medical associations, designed to develop better liaison among physicians of the world. The meeting in Richmond was sponsored by the Robins Company as a part of that firm's observance of its 75th anniversary. Governors of each of the 48 states appointed a 75-year-old physician as delegate to the meeting.

Medicine Ahead of Man

While noting that medical progress had been great in the past 75 years, the physicians also observed that these same advances have demonstrated how very little man truly knows about his own life processes. Much more must be accomplished, the authorities agreed, to make life better, as well as longer.

Notable achievements in the field of internal medicine were reviewed by Dr. Dwight L. Wilbur of the Stanford University School of Medicine. The isolation of Thyroxin, the active principle of the thyroid gland, by Kendall in 1914, and the discovery of insulin by Banting and Best in 1922 led Dr. Wilbur's list.

Decline of Infant Mortality

Contamination of food, and the discovery of its relationship to infant mortality, has been one of the greatest advances leading toward a decline in infant mortality, according to Dr. Irvine McQuarrie of the University of Minnesota Medical College. These discoveries vastly reduced diarrheal diseases, so common among infants 75 years ago. Dr. McQuarrie also stressed the importance of vaccination, heart surgery and artificial feeding of infants in pediatric progress.

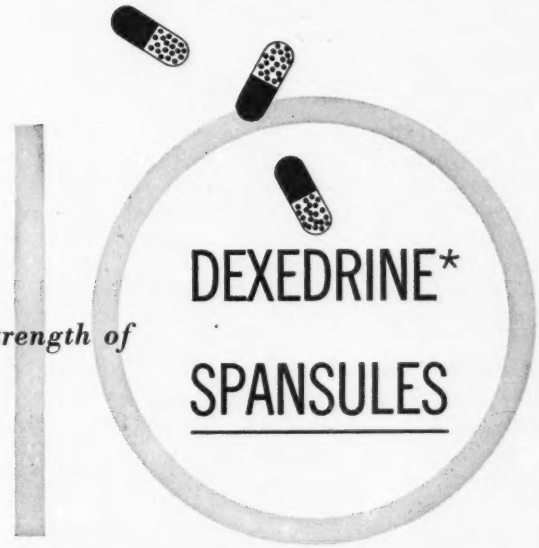
Dr. Leo H. Baremeier of Wayne University College of Medicine counted the past ten years, and not the past 75, as of most importance in the field of psychiatry. Resulting largely from World War II, these psychiatric advances listed by Dr. Baremeier are the blending of organically oriented psychiatry, as developed here in America, with psychoanalytically oriented psychiatry, as developed in Europe.

The development of asepsis led the progress in this specialized field, according to Dr. Alfred Blalock of Johns Hopkins Hospital. Dr. Blalock also pointed out for the physicians attending the Conference that in 1878 the primary aim of surgery was to remove diseased organs, whereas today more emphasis is placed on the preservation of function as well as curing the disease.

Importance of the Meeting

In commenting on the Conference in his column in *The New York Times*, Dr. Howard A Rusk pointed out its importance. "Last week's meeting," he wrote, "where men of medicine sat together and shared their knowledge for the benefit of all, is another example of what can be accomplished when medical leaders recognize their responsibility not only to their patients but to the world in which they live."

The next important meeting of the W.M.A. will be in August, when the First World Conference on Medical Education convenes in London. This Conference will deal primarily with undergraduate education, but the W.M.A. hopes in the future to hold additional meetings on postgraduate medical education, and the medical aspects of social security. It is in this area of assisting the aged to make more out of their retiring years that medicine faces its current challenge.



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Mental Health

••••••••••••*from Page 313*

which would enable infants so afflicted to live comparatively normal lives. This research will include a continuation of detailed biochemical studies of the oxidation of phenylalanine and a search for any new and significant abnormalities as yet unreported in this condition. A special additional value of this research lies in information which may be brought to light concerning the mental defect in phenylketonuria and, through such information, the discovery of a new clue to at least one facet of the biochemistry of normal mental functioning.

Alcoholism and Drug Addiction

The continuing work on drug addiction and addiction-producing agents which is being done at the Public Health Service hospital in Lexington, Kentucky, has uncovered evidence strongly suggestive of certain physiological relationships between chronic alcoholic and chronic barbiturate intoxications. Present indications are that sudden deprivation of alcohol from chronic alcoholics can produce withdrawal symptoms as severe as those occurring in cases of drug addiction. If substantiated, such findings will have considerable influence on the future treatment of alcoholics.

Another phase of research at Lexington has centered about an extremely interesting drug, N-allylnormorphine, which has been known for some time although its clinical applications are fairly recent. This agent has been found to be a specific antidote for poisoning as a result of the use of morphine, methadone and demerol, in spite of fact that it is itself a morphine derivative. It has proved useful as a time-saving and reliable diagnostic agent in cases of suspected physical dependence on morphine. Because of certain of its properties, it will probably become extremely valuable in combating respiratory depression in new-born babies. Most significant, also, is the fact that it is being used in a new series of experiments designed to test the validity of some of our previously accepted hypotheses concerning the mechanisms underlying tolerance and physical dependence of the human organism upon the so-called "addiction-producing" drugs.

Intensive Research Demanded

All of these foregoing studies, however, constitute no more than a brief glimpse of the many and varied types of research science and medicine are conducting into the causes and cures of mental illness in the hope of providing us with new and clearly marked paths to mental health. We have set up standards designed to protect ourselves against such elements as may threaten our ability to live fully and work efficiently. And a large part of these standards involve man's protection against illness and disease. But to cope with mental illness or, more positively, to insure the mental health which is our goal, we must continually increase our understanding of the whole man. This latter aim demands continuing pursuit of additional knowledge of human behavior and the many factors which determine it—physiological, psychological, and sociological.

We must learn much more about how the brain really works and the role which certain sections of the brain play in memory, perception, emotions, and personality controls. We must expand our knowledge of the chemistry of the brain, searching out the secrets of its metabolism and the relationship of brain metabolism to mental aberrations and normal mental function.

We now possess facilities with which to examine single cells of the brain and the central nervous system and, with the electron microscope, minute portions of single cells. There are new techniques and tools which may enable us to determine whether the brain of a normal person differs from the brain of individuals with mental disorders or with such diseases as arteriosclerosis—and the kind and degree of difference.

We know that the endocrine glands are closely associated with physical growth and mental development but we still have far to go in tracking down the clues from which we may eventually devise new techniques to deal successfully with many of the mental disorders which now defy our best therapeutic endeavors.

Psychology and sociology are opening up new avenues for exploration of the different reactions of human beings, individually and in groups, physically and emotionally, to the continually changing stresses which are the natural outgrowth of our continually changing ways of living.

But for all of our growing body of knowledge and experience, many of the bases of man's behavior and the mechanisms of his mind remain unknown. We must, therefore, follow all trails of research that show any evidence of promise. Some may lead only to dead ends, leaving us to retrace our steps and start all over again. Even when a research trail ends in apparent failure, it may compensate by giving us bits of knowledge which will eventually add up to different approaches and new discoveries.

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New A.Ph.A. Members

THE ASSOCIATION EXTENDS A CORDIAL WELCOME TO THE FOLLOWING MEN AND WOMEN WHO WERE ACCEPTED FOR ACTIVE MEMBERSHIP DURING THE MONTH PRECEDING PREPARATION OF THIS ISSUE.

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Richards, R. Q., Fort Myers, Fla.

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Cunningham, John F., Jr., Lafayette
Grinnell, Robert L., San Francisco
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Kraemer, William C., Roselle
Leopold, Nathan R., Haddon Heights
Lisaius, Joseph I., P. O. Wood Ridge
Mannino, Alfred A., Westfield
Margolit, Jack, Camden
Pressman, Alvin M., Camden
Reines, Martin, Riverside
Rosenfield, Albert W., Merchantville
Ross, John, Swedesboro
Sonstein, Solomon, Camden
Trautenberg, Harry, Camden
Weidler Walter F., Camden

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Branson, Thomas W., New York City
Goldman, Robert, Brooklyn
Grajales, C. Yolanda, Bronx
King, John A., Manhasset
Levy, Jacob, Staten Island
Maggiacomi, Humbert N., Pleasant Valley
Toohy, John J., New York City

OHIO

Branscomb, Lewis C., Columbus
Kaczorowsky, Leo, Cleveland Heights
Pater, John A., Hamilton

OREGON

Ciochon, Charles E., Portland
Haag, William G., Portland
Turville, Fred C., Portland

PENNSYLVANIA

Adams, John G., Pittsburgh
Barch, George F., Tarentum
Gefsky, Hyland L., Pittsburgh
Gordon, Herman, Philadelphia
Knox, Harold I., Jr., York
Sudler, Alonzo, Jr., Willow Grove
Yagle, Louis W., Pittsburgh

UTAH

Breithaupt, Robert L., Salt Lake City
Lowe, Sherman B., Salt Lake City
Nelden, Ralph, Salt Lake City
Schnitker, Frank T., Salt Lake City

WASHINGTON

Bhatia, Vishnu N., Pullman
Schaaf, Harold, Seattle

WEST VIRGINIA

Coleman, Marion J., Jr., Huntington
Lowman, J. L., Charleston

WISCONSIN

Eizen, Harry S., Milwaukee
Gallenberger, Donald M., Manitowoc

Deceased Members

Green, Benjamin, Portsmouth, N. H., March 26, 1953 (Life Member)
Klein, Edward Nichols E., Flushing, N. Y., September, 1952 (Life Member)
Naegeli, Floyd C., Jr., Jackson, Wyo., June, 1952
Paul, John D., Philadelphia, Pa.
Pipolo, Angelo, Los Angeles, Calif.
Potts, Delmon, Owensboro, Ky., February 1, 1952
Richards, Vernon R., Minneapolis, Minn.

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STUDENT BRANCHES

At the meeting of the **New England College of Pharmacy Student Branch,** the revision of the constitution was completed and accepted by the members. Mr. Omer Chartrand was chosen to represent the Branch on the panel discussion to be held during the Convention of the Student Branches of the A.PH.A., Districts 1 and 2, at the University of Connecticut. Mr. Christy Vose will be the official representative at this Convention.

Joe Koch was recently elected president of the **University of Nebraska Student Branch.** The other officers are: Robert L. Allen, vice-president; Mary A. Mulligan, secretary; and Donald L. Sorby, treasurer.

The unveiling of an oil portrait of the late Dean Emery T. Motley was sponsored by the **University of South Carolina Student Branch** of the A.PH.A. at the School of Pharmacy, LeConte College, April 12. The portrait by Charles Mason Crowson was presented as a memorial by A. L. Moir, chairman of the Fund Raising Committee. Miss Lois Nichols and Miss Betty Wood, senior students, unveiled the portrait, and Arthur C. Lytle, Jr., instructor at the School of Pharmacy, presented the tribute to Dean Motley. President Donald Russell of the University of South Carolina accepted the portrait for the University.

Dr. George F. Archambault, Pharmacist Director, who is Chief of the Pharmacy Branch, Division of Hospitals of the Public Health Service, spoke on "Opportunities for Pharmacists in The Public Health Service" at the April 7 meeting of the **Massachusetts College of Pharmacy Student Branch.**

At the March 3 meeting of the Branch, Dr. George C. Shicks of St. Barnabas Hospital, Newark, N. J., spoke on "Hospital Pharmacy."

The **University of South Carolina Student Branch** has recently elected the following officers: Dewitt O. Blanchett, president; Jack Watts, vice-president; Robert L. Sawyer, secretary; and George S. Inman, treasurer.

At the March 10 meeting of the **University of Wisconsin Student Branch** a short report was made on the plans for the Spring Formal which is to be held at Trip Commons May 16. The Senior Banquet to be held on May 24 was discussed, and the following juniors volunteered to take charge: Bob Schaefer, Al Barth, Len Mitchell, Ken Consuhn, and Vince Crane.

During the April 14 meeting, all committees gave reports on their activities.

LOCAL BRANCHES

The **Northwestern Ohio Branch** held its April 28 meeting at the Toledo University's Student Union Building. Guest speaker was Dr. Roscoe H. Snyder who spoke on "Medical Civil Defense in Toledo."

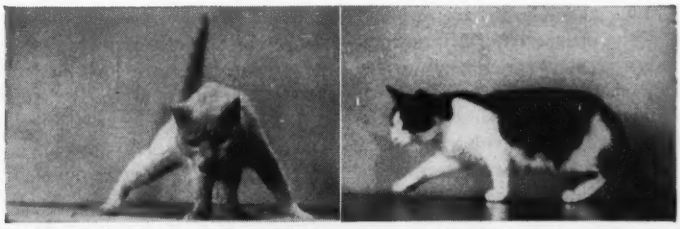
A Forum on Narcotic Practices was held at the April 30 meeting of the **City of Washington Branch,** with the following panel: V. D. Trygstad, Pharmacy Division, Veterans Administration, Central Office, moderator; Harold C. Kinner, secretary, Board of Pharmacy District of Columbia, retail pharmacist; Walter Stockton, Gilpin Co., wholesaler; Eddie Wolfe, chief pharmacist, Mount Alto Hospital, Veterans Administration; Jack White, chief pharmacist, George Washington Hospital, Civilian Hospital; J. McNamara, Capt., U.S.A., chief pharmacist, Walter Reed Hospital; R. M. Cox, Lieut., U.S.N., chief pharmacist, Naval Medical Center, Bethesda, Md.; and Henry W. Beard, Lieut., U.S.P.H.S., chief pharmacist, Outpatient Clinic, U. S. Public Health Service, Washington, D.C. Each participant gave a five to seven minute presentation of his narcotic procurement and expenditure methods and related problems.

The **Northwestern Branch** held a dinner meeting on April 21 at the Center for Continuation Study at the University of Minnesota. (It is customary for the Branch to hold a meeting there each year, while the refresher course is offered). Dr. J. Ryan of St. Paul, guest speaker of the evening, discussed the topic "Radioactive Isotopes as Used for Medical Purposes."

At the same meeting officers for the following year were elected: Lawrence H. Mueller, president; A. O. Peterson, vice-president; Mrs. Jean Roetman, secretary; and Gordon Wittich, chairman of Executive Committee.

New principle in Streptomycin Therapy

The hazard of ototoxicity is greatly reduced by combining equal parts of streptomycin sulfate and dihydrostreptomycin sulfate. The patient thus gets only *half* as much of each drug. The risk of vestibular damage (from streptomycin) and of hearing loss (from dihydrostreptomycin) is greatly reduced. Therapeutic effect is undiminished. This principle has been demonstrated in both animals and man. In patients treated for 120 days with 1 Gm. per day of the combined drugs, the incidence of neurotoxicity was practically zero.



Cat treated with streptomycin is ataxic.

Cat treated with the same amount of streptomycin-dihydrostreptomycin has normal equilibrium.

DISTRYCIN (di-STRI-sin) Squibb Streptomycin Sulfate *and* Dihydrostreptomycin Sulfate in equal parts

FOR GREATER SAFETY IN COMBINED ANTIBIOTIC THERAPY

These new formulations embody this new principle:

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Dihydrostreptomycin sulfate, Gm.	0.5	0.25	0.5	0.25
Procaine penicillin G, units	—	300,000	300,000	400,000
Potassium penicillin G, units	—	100,000	100,000	—

(All supplied in 1 and 5 dose vials)

'Distrycin' and 'Dicrysticin' are registered trademarks; 'Distrycillin' is a trademark.

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BRIEFLY NOTED

COLLEGES

L. D. Barney, president of Hoffmann-LaRoche, addressed the alumni of **Columbia University, College of Pharmacy,** at the Annual Award Dinner, Hotel Astor, N. Y., May 3. Mr. Barney presented a biographical sketch of Myron Walker, Walker Laboratories, Inc., who was the guest of honor and recipient of the alumni award for services rendered to the College of Pharmacy and the pharmaceutical profession.

On April 30 a Pharmacy Conference was held on the campus of the **University of Mississippi.** The program was designed to combine information of current technological advances with practical aspects of merchandising methods, and speakers included both faculty members of the School of Pharmacy and representatives of the pharmaceutical industry.

The University of Puerto Rico celebrated the Fiftieth Anniversary of its founding on March 12. As the College of Pharmacy's part in the celebration, Dr. Paul C. Olsen gave a lecture on "Pharmacy in Puerto Rico in the Next Fifty Years."

Dr. Ivor Griffith was re-elected president of the **Philadelphia College of Pharmacy and Science** at the Annual Meeting on March 30. At the same meeting, Dr. Paul S. Pittenger, vice-president of Sharp & Dohme, Inc., was elected a trustee of the College.

Dr. John L. Voigt has been appointed as director of Pharmacy Extension at **Rutgers University College of Pharmacy,** Newark, N.J. Dr. Voigt will remain in his position as professor of pharmacy at the University of Mississippi School of Pharmacy until the close of the present school year.

In celebration of its diamond jubilee, the **University of Pittsburgh School of Pharmacy** held open house on April 15 and 16. One feature of this occasion was a new sound movie entitled "Old Doc." This motion picture was written and produced by the faculty of the School of Pharmacy. Its purpose is to show the role of the pharmacist in the community.

J. Curtis Nottingham, executive secretary of the Virginia Pharmaceutical Association, has been named president-elect of the Association of 6,600 alumni of the **Medical College of Virginia.**

The Second Annual Rutgers Pharmaceutical Conference was held on the campus of **Rutgers University** on May 13. At the afternoon session, Dr. Robert P. Fischelis, secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION, served as Moderator for a panel discussion on "What Members of the Pharmaceutical and Allied Health Fields Expect from Each Other." Dr. Harrold A. Murray, president of The Medical Society of New Jersey, spoke from the point of view of the physician; John J. Toohy, vice-president of E. R. Squibb & Sons, the pharmaceutical industry; Grover C. Bowles, president of the American Society of Hospital Pharmacists, the hospital pharmacist; James E. Allen, vice-president of Henry B. Gilpin Co., the drug wholesaler; and Ira I. Schwarz, president of New Jersey Pharmaceutical Association, the retail pharmacist.

ASSOCIATIONS

At the April 15 meeting of the **National Association of Chain Drug Stores** the following officers were elected: president, S. J. Besthoff, president of Katz and Besthoff, New Orleans; vice-president, G. B. Burrus, president of Peoples Drug Stores, Washington; and re-elected secretary and treasurer, Carl Willingham.

The Eleventh Spring Conference of the **Michigan Academy of Pharmacy** held in Detroit on Wednesday, April 29, honored the memory of the late Dr. W. E. Upjohn, founder of The Upjohn Co. of Kalamazoo, for his many contributions to the profession of pharmacy.

(Continued on page 334)

HOTEL RESERVATION FORM

1953 CONVENTION

AMERICAN PHARMACEUTICAL ASSOCIATION

August 16–22, 1953 — Salt Lake City, Utah

Except as otherwise announced, all meetings will be held at the Hotel Utah, Main Street and South Temple. NO RESERVATIONS WILL BE ACCEPTED DIRECTLY BY HOTELS. Use the following form in making all reservations.

A.PH.A. HOUSING COMMITTEE
SALT LAKE CITY CONVENTION BUREAU
P. O. Box 329
Salt Lake City 10, Utah

Please make hotel reservation(s) as shown below:

HOTEL.....First Choice
HOTEL.....Second Choice
HOTEL.....Third Choice

(If the hotels of your choice are unable to accept your reservations, the Housing Committee will make as good a reservation as possible elsewhere.)

Number of room(s) with bath.....*Double room(s).....Rate preferred $.....
.....Twin Bedded rooms.....Rate preferred $.....
.....Single room(s).....Rate preferred $.....

Arriving August.....Approximately.....a.m.....p.m. Leaving August.....
(Checkout hour 3:00 p.m.)

* A "double" room contains only one bed, for occupancy by two persons.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED

Please print the names of both persons for each double room or twin bedded rooms requested. Also names of all persons for whom you are requesting reservations and who will occupy the rooms asked for; OTHERWISE APPLICATION WILL BE RETURNED.

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APPLICANT..... STREET ADDRESS.....

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HOTEL RATES IN SALT LAKE CITY

HOTEL	Single	Double	Twin	Suites
Utah	5.00 –10.00	7.00 –13.00	9.00–12.00	15.00–25.00
Carlton	2.00*– 5.00	5.00 – 6.00	7.00	12.00–15.00
Newhouse	4.50 – 9.00	6.50 –10.00	7.00– 9.00	12.00–20.00
Temple Square	3.50 – 4.50	5.00 – 6.50	7.00– 9.00	
Wilson	2.00*– 5.00	3.00*– 6.00	4.00– 7.00	
Congress	3.50 – 4.00	4.00 – 5.50	6.00– 8.00	15.00
New Grand	2.50*– 6.00	3.50*– 7.00	5.00– 8.00	
Miles	2.50*– 4.50	3.00*– 5.00	6.00	8.00
Belvedere	4.00 – 6.00	5.00 – 6.00	7.00	10.00–12.00
Covey's New America Motel	4.50 – 5.00		7.00 –10.50	9.50–12.50

* Without bath

Mail Request for Room Reservations to:

A.PH.A. HOUSING BUREAU

Salt Lake City Convention Bureau
P. O. Box 329, Salt Lake City 10, Utah

Briefly Noted

• • • • • • • • • • • • *from page 332*

The American Heart Association held its Annual Meeting and Scientific Session in Atlantic City, N.J., April 8–12. For his outstanding assistance to the Heart Program, Bruce Barton, new chairman of the Board of Directors, received the Gold Heart Award, highest honor of the Association, at its annual dinner, April 10. The initial presentation of the Annual Howard W. Blakeslee Award, in the amount of $1,000 for outstanding scientific reporting in the field of heart and blood vessel diseases, was also made at the Annual Dinner to Wade Arnold, executive director of the National Broadcasting Co.

Donald S. Gilmore was re-elected as president of the **American Drug Manufacturers' Association** at the Association's Annual Meeting in Boca Raton, Fla., on April 15. Mr. Gilmore is chairman of the Board and managing director of The Upjohn Co., Kalamazoo, Mich. Elected vice-presidents were the following: W. L. Dempsey, president of Sharp & Dohme; Dr. J. H. F. Dunning, president of Hynson, Westcott and Dunning; Dr. Theodore G. Klumpp, president of Winthrop-Stearns; and Dr. Ernest H. Volwiler, president of Abbott Laboratories. M. C. Eaton, president of Norwich Pharmacal Co. and Eaton Laboratories, was re-elected treasurer.

The Federation of American Societies for Experimental Biology held its Annual Meeting at the Conrad Hilton Hotel, Chicago, Ill., April 6–10. The Federation includes the American Physiological Society, American Society of Biological Chemists, American Society for Pharmacology and Experimental Therapeutics, American Society for Experimental Pathology, American Institute of Nutrition, and American Association of Immunologists. Reports of new research were presented and discussed at the various scientific sessions.

The Annual Meeting of the **Walter Reed Society** was held in Chicago on April 8. The Annual Award was presented to Dr. Lloyd Koritz, who has served as a subject in six experimental projects, several of them highly dangerous. Dr. Max Sadove was re-elected president. Other officers elected were: Dr. Charles Code, Dr. Clinton H. Thienes, Dr. Y. T. Oester as vice-presidents; and Dr. Frances A. Hellebrandt as secretary-treasurer.

High-ranking public health officials from seven American Republics met in Washington, D.C., April 21–May 1, as representatives of their governments on the Executive Committee of the **Pan American Sanitary Organization.** The delegates reviewed the public health activities being carried out in the Americas with the technical assistance of the Pan American Sanitary Bureau, Regional Office of the World Health Organization.

AT RANDOM

Dr. C. T. Van Meter has accepted a research appointment on Project Big Ben at the University of Pennsylvania. He left his previous post of director of research and control at Reed and Carnrick, Jersey City, N.J., about May 1. Prior to entering the industrial field in 1944, Dr. Van Meter served for many years on the faculty of the School of Pharmacy at the University of Pittsburgh.

Mr. Nicholas S. Gesoalde, secretary of the New York State Pharmaceutical Association, was recently appointed a member of the Minimum Wage Board by Industrial Commissioner Edward Corsi to consider and recommend revised minimum wage standards for the Retail Trade Industry in the State of New York. During April the Board, held public hearings in order to receive evidence, suggestions, and opinions from employers, employees, and all other interested persons.

On March 26 the **32 Carat Club of Philadelphia** paid tribute to Dr. Ivor Griffith, president

(*Continued on page 336*)

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Briefly Noted

• • • • • • • • • • • • *from page 334*

of the Philadelphia College of Pharmacy and Science. Dr. Griffith was the guest of honor at a dinner meeting of the Club, which is made up of business and professional leaders in the community and noted for its generosity to many charitable and civic activities.

Dr. Edward C. Elliott, who served as director of the *Pharmaceutical Survey,* has been appointed educational adviser to the Commanding General of the Ordnance Command. He is now on duty at the Aberdeen Proving Ground in Maryland.

OBITUARIES

The AMERICAN PHARMACEUTICAL ASSOCIATION regrets to note the death of Joseph A. DeRosa, former member and president of the New Jersey State Board of Pharmacy, member of the A.PH.A., and a trustee of the New Jersey Pharmaceutical Association. Until his death on February 22, he operated a pharmacy at 146 Summit Avenue, Jersey City, N.J., with his brother.

Westwood Dana Case, a member of the A.PH.A. and the Minnesota State Pharmaceutical Association, died last September at the age of 92. He began his pharmaceutical career in April, 1879, and was doing relief work in Lanesboro, Minn., until last summer.

The AMERICAN PHARMACEUTICAL ASSOCIATION mourns the loss of Benjamin Green, Portsmouth, N.H., who joined the ASSOCIATION in 1888 and at the time of his death was a life member.

His death occurred on March 26, 1953, at the age of 85. He was a life-long resident of Portsmouth and operated Green's Drug Store on Market Square for more than fifty years, until his retirement several years ago.

Not only was Mr. Green a loyal member of the A.PH.A., but he took particular interest in developing its membership, especially in New Hampshire. He took the time to write letters to many pharmacists in his state, urging them to become affiliated with pharmacy's national professional society and his correspondence with the office of the Secretary revealed a keen interest in the growth of the ASSOCIATION and in everything that augurs well for American pharmacy.

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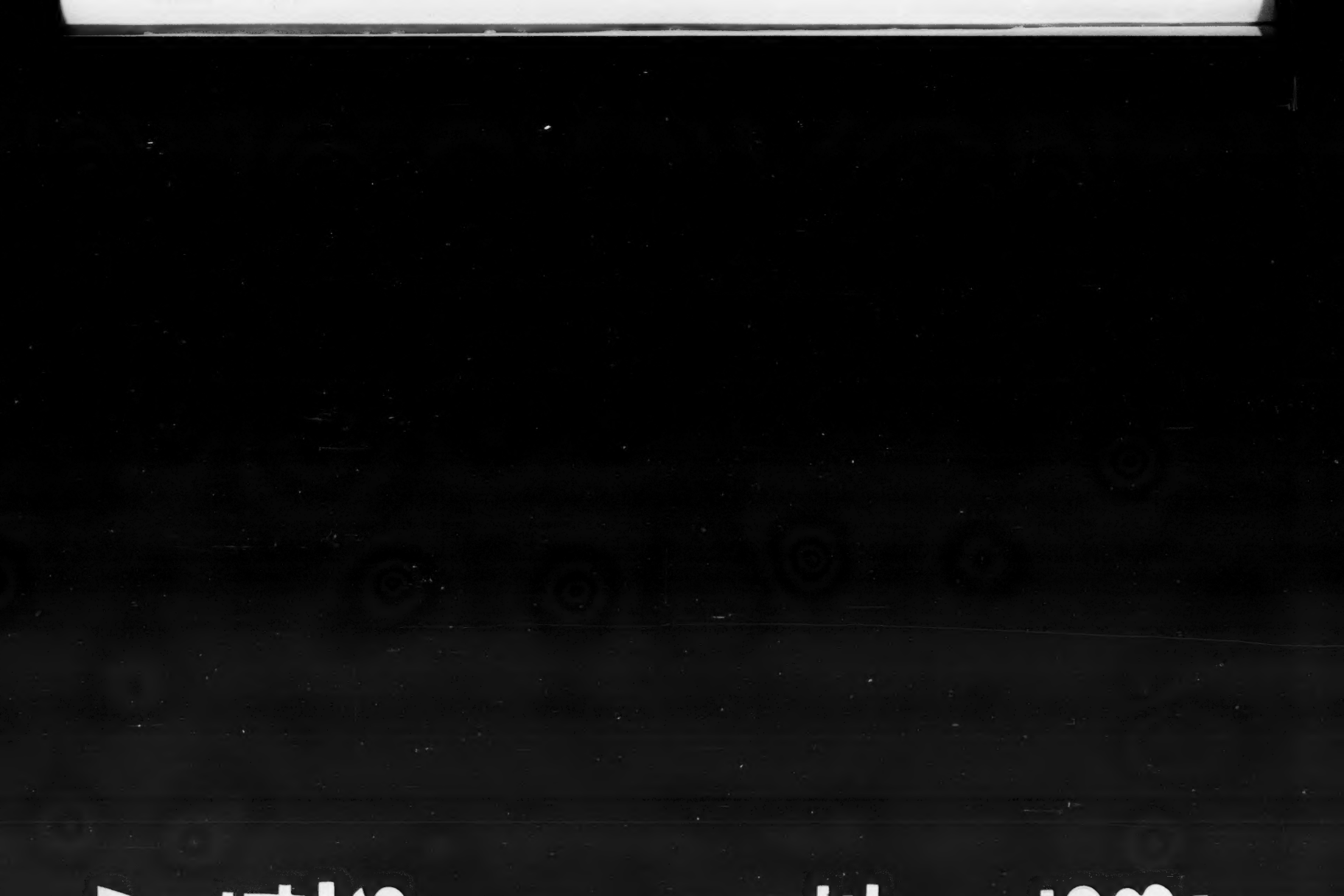

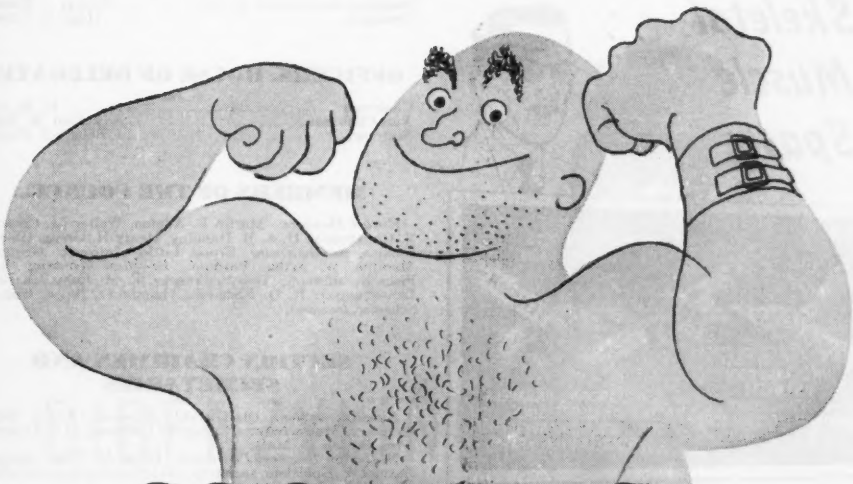

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Section on Practical Pharmacy: Elmer M. Plein, chairman; Samuel W. Goldstein, secretary, 2215 Constitution Ave., N.W., Washington 7, D. C.

Section on Education and Legislation: J. L. Voigt, chairman; Robert A. Walsh, secretary, 179 Longwood Ave., Boston, Mass.

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Section on Historical Pharmacy: Edward S. Brady, chairman; Edward J. Rowe, secretary, 5819 E. Washington St., Indianapolis 1, Ind.

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Robert P. Fischelis, Phar.D., Sc.D., secretary and general manager; Felix B. Gorrell, controller and office manager.

Justin L. Powers, Ph.D., National Formulary and *Scientific Edition* of THE JOURNAL OF THE A. PH. A.; Bernard Zerbe, A.B., *Practical Pharmacy Edition of* THE JOURNAL OF THE A. PH. A.; Samuel W. Goldstein, Ph.G., Ph.D., laboratory; Don E. Francke, Sc.D. and Gloria Niemeyer, B.Sc., hospital pharmacy; Mary Louise Bergner, A.B., membership.

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RECENT

PROGRESS IN MEDICINE

Treatment of Snake Venom Poisoning with Cortisone and ACTH

Two physicians of the Clinch Valley Clinic Hospital of Richlands, Va., report markedly good results in the treatment of snake bite (copperhead moccasin) through the use of cortisone and ACTH. Two of the patients were five-year-old white boys, and the other a four-year-old white girl, and the physicians note that "a generally poor prognosis would have been expected, because of their age and size." Treatment consisted of immediate application of a tourniquet, and administration of antivenom and antitoxin. In the case of the small girl, this treatment had no marked effect, with the temperature remaining elevated and increased swelling after 24 hours. Administration of cortisone, 25 mg. orally every six hours, was begun, and within eight hours, the temperature had declined to normal, pain had subsided, and the patient obviously improved. Three days later the patient was discharged, essentially well. Comparable results were noted in the other two children. One boy received only one intramuscular injection of 25 mg. of ACTH along with other therapy. The physicians conclude that cortisone and corticotropin are valuable adjuvants in the treatment of this type of poisoning.

(Hoback, William W., and Green, Thomas W., *J. A. M. A.*, **152**: 236, May 16, 1953.)

Resyl in Tetanus

A physician from the Division of Communicable Diseases, Los Angeles County Hospital, Los Angeles, Calif., has reported the first use in this country of *o*-methoxyphenyl glyceryl ether (Resyl, Ciba) in the treatment of tetanus. The treatment included administration of chloral hydrate, tetanus antitoxin, Resyl (0.5-5.0 per cent solutions by continuous intravenous drip, 11-64.8 Gm. being given in one day; and 8-24 Gm. per day orally), along with either penicillin, crystacillin, or chloramphenicol. A report on the successful treatment of four cases with Myocaine (another brand of *o*-methoxyphenylglycerylether) had appeared in a European journal. *o*-Methoxyphenyl glyceryl ether, because of minimal side effects, is superior, according to the physician, to mephenesin. Since this report, six additional patients have been treated with Resyl with equally good results. A tendency to cause simulation of paralytic ileus owing to the relaxing effect was noted. In addition to his report of this particular case, Dr. Bower also summarizes the past literature in the treatment of tetanus.

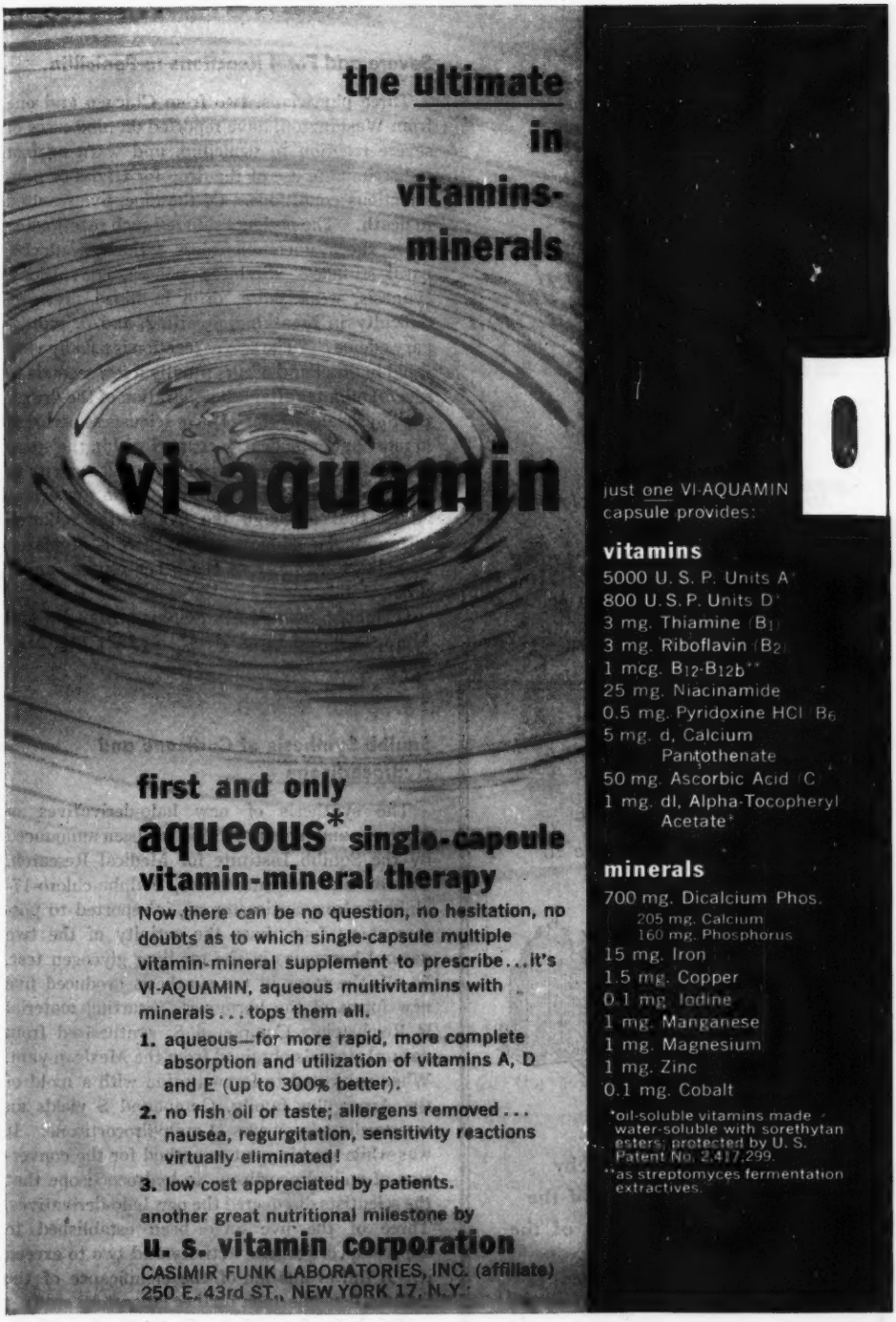
(Bower, A. G., *Calif. Med.*, **78**: 468, May, 1953.)

Single Treatment with Bicillin for Syphilis

Bicillin (brand of dibenzylethylenediamine dipenicillin G), new long-acting penicillin, may become the "Magic Bullet" of Ehrlich's dream for the treatment of syphilis. In a test group of 125 patients with syphilis, Bicillin proved safe and effective in a single treatment. After the single injection of 2,500,000 units, the patients exhibited the same recovery as those who took the long series of penicillin treatments, and after a year, 94 per cent of the 125 had negative blood tests. Of the 6 per cent with a positive test, some had been reinfected. The patients tested were in the primary and secondary stages; none were in the final or tertiary stage. The U.S. Public Health Service, according to statements made recently in Philadelphia, considers Bicillin the best possibility to date in the long fight against the disease.

(Dr. Clarence A. Smith, assistant chief of The Venereal Disease Division, U.S. Public Health Service, speaking at the 5th Annual Symposium on Venereal Disease, Philadelphia, May 1, 1953.)

(Continued on page 344)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1 mcg. B12-B12b**
25 mg. Niacinamide
0.5 mg. Pyridoxine HCl (B6)
5 mg. d, Calcium Pantothenate
50 mg. Ascorbic Acid (C)
1 mg. dl, Alpha-Tocopheryl Acetate*
minerals
700 mg. Dicalcium Phos.
205 mg. Calcium
160 mg. Phosphorus
15 mg. Iron
1.5 mg. Copper
0.1 mg. Iodine
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Severe and Fatal Reactions to Penicillin

Three physicians, two from Chicago and one from Washington, have reported on nine cases of severe reaction to penicillin, and warn against indiscriminate use of the drug for trivial or non-infectious conditions. Of the nine, five resulted in death. The patients suffered such reactions as hives, shock, unconsciousness, asthma, headache, nasal stuffiness, dizziness, nausea, convulsions, cyanosis, weak pulse, drop in blood pressure, difficulty in breathing, vomiting, and/or pulmonary edema. "The severe reaction is usually very rapid in onset and occurs usually a few seconds to several minutes after administration of the drug," the physicians wrote. Unconsciousness occurred in most patients; death occurred within the space of a couple minutes to two hours, and appears to result from shock or asphyxia. The physicians added that although the five deaths followed intramuscular administration, there is no reason to believe that any of the other routes cannot prove fatal.

(Feinberg, Samuel M., Feinberg, Alan R., and Moran, Clifford F., *J. A. M. A.*, **152**: 114, May 9, 1953.)

Squibb Synthesis of Cortisone and Hydrocortisone

The synthesis of new halo-derivatives of cortisone and hydrocortisone has been announced by the Squibb Institute for Medical Research. One of the new substances, 9-alpha-chloro-17-alpha-hydroxycorticosterone, is reported to possess about four times the activity of the two natural hormones in the rat liver glycogen test. In all, the steps in the synthesis produced five new forms of the hormones. Starting material is Reichstein's Compound S, synthesized from natural steroids obtained from the Mexican yam. When subjected to fermentation with a mold of the Aspergillus family, Compound S yields an intermediate known as 11-epihydrocortisone. It was while working out a method for the conversion of epihydrocortisone to hydrocortisone that the scientists discovered the new halo-derivatives. Three of the five have been established to approach cortisone in activity and two to exceed it. A full evaluation of the significance of the findings depends upon further laboratory study.

(Fried, Josef, and Sabo, Emily F., *J. A. C. S.*, **75**: 2273, May 5, 1953.)

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Members of the American Pharmaceutical Association are invited to submit their professional problems to The Journal, 2215 Constitution Ave., N. W., Washington 7, D. C., giving all pertinent details.

Vleminckx' Solution with Resorcinol

A dermatologist has asked me to prepare a special formula for him consisting of the following:

Rx:

Vleminckx' Solution	*15.0 cc.*
Resorcinol or Betanaphthol	*10.0 Gm.*
Alcohol	*100.0 cc.*
Distilled Water q.s.	*500.0 cc.*

Please let me know whether this preparation would be possible from a pharmaceutical viewpoint.—M. G., New York.

Admixture of the ingredients, whether the resorcinol or the Vleminckx' solution is added last, gives a precipitate which settles rapidly. Suspending agents, such as sodium carboxymethylcellulose, methylcellulose, and sodium alginate, are not effective as protective colloids with this mixture.

A fairly uniform suspension is obtained by replacing 200 cc. of the water in the formula with Bentonite Magma. The product assumed a greenish yellow color on standing for two days in a colorless Pyrex glass container, but it mixed readily on shaking to give a uniform suspension.

The modified formula and directions follow:

Rx:

Vleminckx' Solution	15.0 cc.
Bentonite Magma	200.0 cc.
Resorcinol	10.0 Gm.
Alcohol	100.0 cc.
Distilled Water *q.s.*	500.0 cc.

Dissolve the resorcinol in the alcohol and add water to 200 cc., then mix with the Bentonite Magma. Mix the Vleminckx' solution with 85 cc. of water and add the mixed solution to the resorcinol and bentonite mixture with agitation. Protect the preparation from light. Use a "shake-well" label.

The solubility of betanaphthol is 1 Gm. in 1000 cc. of water and in 0.8 cc. of alcohol. We have found that 1 Gm. of betanaphthol is soluble in 27.5 cc. of 34.5 per cent alcohol and in 66 cc. of 29 per cent alcohol. The 10 Gm. of betanaphthol in the formula would require about 660 cc. of 29 per cent alcohol for solution. Your formula contains only about 11 per cent alcohol, and most of the betanaphthol would be precipitated on addition of the aqueous mixtures to the alcoholic solution of the betanaphthol.

Bacitracin Ointment and Lotion

From an item in A.Ph.A. Journal, Scientific Edition, December, 1952, "The Effects of Surface Active Agents on Bacitracin," I extemporized recently for a physician here by making the following solution:

Bacitracin, 10,000 units; Alkyldimethylbenzylammonium Chloride (B.T.C. of Onyx Oil & Chem. Co.), 1:1000; Isopropyl Alcohol, 25 per cent; Polyethylene Glycol 400, 10 per cent; and Distilled Water q.s., 30 cc. Result, excellent.

If possible, I would appreciate information on the best method to prepare a lotion and a water-miscible (non-greasy) base for the combination of bacitracin and B.T.C. The recent edition of U.S. Dispensatory suggests an ointment or cream base consisting of: Cetyl Alcohol, Glycerin, Sodium Lauryl Sulfate, and Water.—J. J. D., Louisiana.

In the formulation of preparations containing bacitracin or other antibiotics, it is advisable to have the final products tested for antibacterial stability. Pharmaceutical elegance does not necessarily indicate stability of the active ingredient. The quaternary ammonium compound is omitted to keep the pH in the acid range. Bacitracin is usually more stable in water-free preparations.

The following lotion vehicle could be tried with bacitracin:

Rx No. 1:

Polyethylene Glycol 1540 Distearate	6.0 Gm.
Polyethylene Glycol 300 Distearate	6.0 Gm.
Stearic Acid	13.0 Gm.
Methylparaben	0.1 Gm.
Distilled Water *q.s.*	75.0 Gm.

Heat the mixed glycol esters, stearic acid, and methylparaben to 80°. Heat the water to the

(Continued on page 348)

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Rx Information

• • • • • • • • • • • • • *from page 346*

same temperature and add it slowly, with stirring, to the mixture. Stir until cool.

The following water-miscible base can be tried:

Rx No. 2:

Polyethylene Glycol 600 Distearate	10.0 Gm.
Polyethylene Glycol 400 Distearate	5.0 Gm.
Methylparaben	0.1 Gm.
White Petrolatum	85.0 Gm.

Melt and stir until cool.

Zinc Oxide Suspension in Isopropyl Alcohol

In the following prescription I would like to know how the ingredients could be suspended, homogenized, or emulsified in the isopropyl alcohol to make a stable preparation. Also what could be done about masking the odor of the isopropyl alcohol?

Rx:

Camphor	*4.0 gr.*
Menthol	*4.0 gr.*
Zinc Oxide	*5.0 Gm.*
Isopropyl Alcohol, 70%, q.s.	*100.0 cc.*

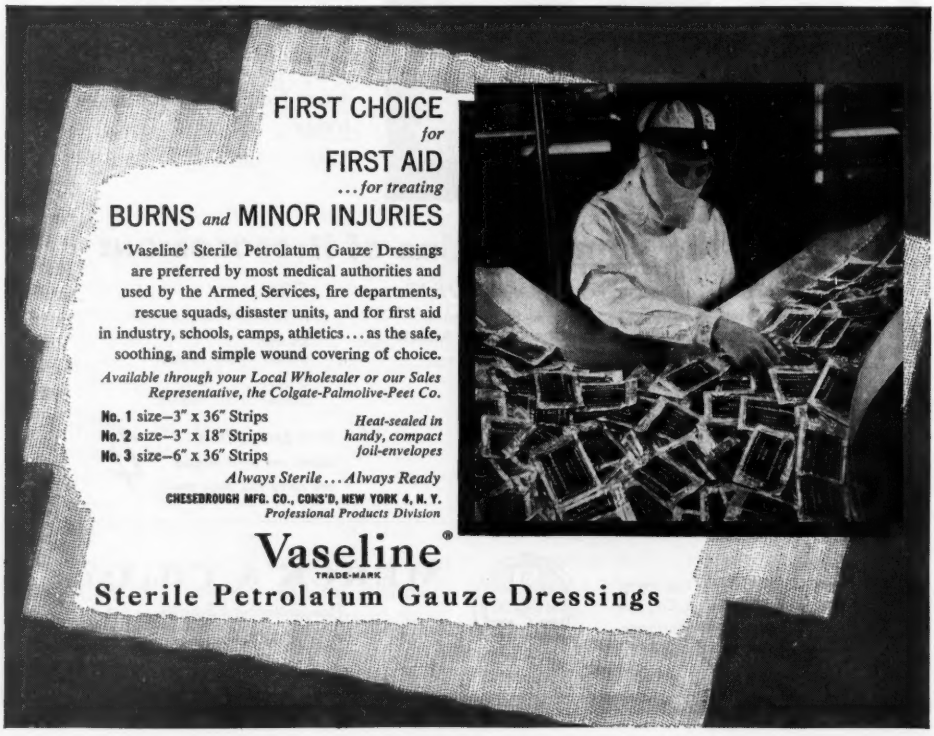
—J. R. deL., Texas.

The addition of 2 per cent of methylcellulose 100 cps. permits the preparation of a smooth suspension.

Mix the methylcellulose with a portion of the isopropyl alcohol (70 per cent) to form a paste. Dissolve the camphor and the menthol in the remainder of the isopropyl alcohol (70 per cent) and add the solution to the paste. Mix the zinc oxide with the liquid and run the mixture through a hand homogenizer.

The following procedure also will yield a smooth, creamy suspension: The methylcellulose can be mixed with the zinc oxide before adding the isopropyl alcohol (70 per cent) in which the camphor and menthol are dissolved. A mechanical mixer can be employed to disperse the mixture.

A perfume can be added to mask the isopropyl alcohol odor. Phenylethyl alcohol in 1 per cent concentration has a slight masking effect.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DIBENZYLINE

Description: Each capsule contains 10 mg. of phenoxybenzamine hydrochloride (N-phenoxyisopropyl-N-benzyl-β-chlorethylamine hydrochloride).

Indications: For the treatment of peripheral vascular disorders (vasospastic, occlusive) and hypertension due to pheochromocytoma.

Administration: Oral dosage should be adjusted for each patient by the physician.

Form Supplied: Bottles of 100 capsules.

Source: Smith, Kline & French Laboratories, Philadelphia, Pa.

DU-BIOTIC TROCHES

Corrected Description: Each troche contains: Bacitracin, 200 units; neomycin sulfate, equivalent to neomycin base, 3.5 mg.; and propesin (propyl *p*-aminobenzoate), 2 mg. (White Labs., Inc.)

For additional information see THIS JOURNAL, April 1953, page 205.

MONICHOL

Description: Each teaspoonful (5 cc.) contains: polysorbate 80, 500 mg.; choline dihydrogen citrate, 500 mg.; and inositol, 250 mg.

Indications: For treatment in those conditions characterized by hypercholesteremia of the idiopathic or familial type. It is also of value in disturbances of the cardiovascular system associated with hypercholesteremia.

Administration: 1 teaspoonful four times daily; or two teaspoonfuls twice daily; or as directed by the physician. Should not be administered concomitantly with mineral oil preparations.

Form Supplied: Bottles of 12 oz.

Source: Ives-Cameron Company, Inc., New York, N.Y.

VASTRAN

Description: Each scored tablet contains: nicotinic acid, 50 mg.; thiamine mononitrate, 10 mg. riboflavin, 5 mg.; and ascorbic acid, 100 mg.

Indications: For use in treating tension headache, neuralgia, migraine, neurasthenic syndromes; as adjunctive therapy in recovery from surgery, other states of shock and debility and for relief of pain associated with certain peripheral vascular disturbances, chronic osteoarthritis, bursitis and fascitis.

Administration: One tablet three times daily as required to produce a temporary flush. Best results are obtained by administering Vastran before meals. Should flushing become annoying, administer the recommended dose after meals.

Form Supplied: Bottles of 100 and 500 tablets.

Source: Wampole Laboratories, Philadelphia, Pa.

VIOMYCIN

Description: Viomycin sulfate is a tuberculostatic antibiotic.

Indications: For treatment of infections caused by tubercle bacilli.

Administration: The recommended dosage of Viomycin is 2.0 Gm. every third day, given in divided doses at 12-hour intervals by intramuscular administration only. Viomycin is prepared by adding 2 to 5 cc. of water for injection to contents of the vial and gently shaking until solution is effected. The solution may be kept at room temperature for a short time, but for storage should be refrigerated, at which temperature the solution will retain potency for one week. Viomycin therapy should be prescribed in combination with streptomycin, dihydrostreptomycin, para-aminosalicylic acid or isonicotinic acid hydrazide. It should be administered only under careful supervision of a physician.

Form Supplied: As a sterile powder in Steri-Vials containing the equivalent of 1.0 Gm. of Viomycin base; individual cartons and packages of 10.

Source: Parke, Davis & Company, Detroit, Mich.

Other New Products

AUREOMYCIN TRIPLE SULFAS

Aureomycin Triple Sulfas, a combination of a broad spectrum antibiotic and the sulfapyrimidines, has been placed on the market by *Lederle Laboratories Division, American Cyanamid Company.* Each tablet contains: aureomycin, 125 mg.; sulfadiazine, 167 mg.; sulfamerazine, 167 mg., and sulfamethazine, 167 mg. The new product should be administered either after a meal or with a bland drink, such as milk, and patients should be under clinical supervision during the course of treatment. The tablets are packaged in bottles of 12.

(Continued on next page)

BETASYNPLEX NIPHANOID—NEW FORM

A new packing of Betasynplex Niphanoid, omitting the diluent, has been recently announced by *Winthrop-Stearns, Inc.*, for immediate distribution throughout the country. The product is an injectable, highly concentrated mixture of synthetic vitamin B complex factors, including B_{12}. The special packing permits hospitals to use their own distilled water.

CHLOR-TRIMETON INJECTION—NEW DOSAGE SIZES

Schering Corporation has recently introduced two new dosages of Chlor-Trimeton Injection. Chlor-Trimeton Injection "10" is supplied in 10 mg. per cc., 1-cc. ampul, box of 6; Chlor-Trimeton Injection "100," in 100 mg. per cc., 2-cc. multiple dose vial, box of 1.

CRYSTALLINE VITAMIN B_{12}—NEW PACKAGE SIZE

The Wm. S. Merrell Company recently announced the marketing of a new package size of Crystalline Vitamin B_{12}. The injection (for intramuscular or subcutaneous use) is now supplied in 10-cc. multiple dose vials with 1,000 mcg. per cc. The injection also contains benzyl alcohol 1.5 per cent.

DIGITALINE NATIVELLE INTRAMUSCULAR

Digitaline Nativelle in intramuscular form has recently been introduced by *Varick Pharmacal Company*, a division of E. Fougera & Company, Inc. Digitaline Nativelle has been marketed in tablet form and as an intraveneous solution for many years. Digitaline Nativelle Intramuscular is supplied in 1-cc. and 2-cc. ampuls, in boxes of 6 and 50. Each cc. provides 0.2 mg. of digitoxin in a solvent mixture containing polyethylene glycol 300, 39 per cent; benzyl alcohol, 4 per cent; ethyl alcohol, 4 per cent; distilled water 19 per cent; and glycerin, 44 per cent.

DIMETHYLANE

Manufactured by *The National Drug Company*, Dimethylane is 2,2-diisopropyl-4-methanol-1,3-dioxolane—available in 0.25-Gm. enteric-coated capsules. Dimethylane blocks interneural transmission, and is indicated as a relaxant in muscular spasm and tension. It does not cause sedation or hypnosis. The recommended dosage is 2 capsules after meals and at bedtime.

DURACILLIN A.S.—VETERINARY FORM

Eli Lilly and Company is marketing an antibiotic medicine for veterinary use only. It is the veterinary form of Duracillin A.S. (procaine penicillin-G in aqueous suspension). According to veterinarians, intramuscular injection of Duracillin A.S. is indicated for abscesses, arthritis (joint ill), carbuncles, fistula in horses, metritis, navel infections, shipping fever, and infections of wounds or burns. It is available in 10-cc., multiple-dose, rubber-stoppered vials of 300,000 units per cc. and a disposable, plastic syringe containing a single dose of 1,000,000 units.

KAOPECTATE WITH NEOMYCIN

The Upjohn Company has recently introduced "Kaopectate with Neomycin." Each fl. oz. contains: neomycin sulfate, equivalent to 210 mg. neomycin base, 300 mg.; kaolin, 5.832 Gm.; pectin, 0.13 Gm.; suspended with methylcellulose, 1.25 per cent. It is indicated in the symptomatic treatment of diarrhea and as a specific therapy in bacterial diarrhea caused by neomycin-susceptible organisms. The recommended oral dose is: adults—2 to 4 tablespoonfuls four times daily; children (over two years)—2 to 4 teaspoonfuls four times daily; and infants (under two years)—1 to 2 teaspoonfuls four times daily. "Kaopectate with Neomycin" is supplied in pint bottles.

NOCTEC—NEW DOSAGE SIZE

Noctec (chloral hydrate, Squibb) is now available in a small size, $3^3/_4$ gr. capsule, it has been announced recently by *E. R. Squibb & Sons*. The new size capsules are especially useful in sedation for children and for adults who require a smaller dose.

RAUDIXIN—NEW DOSAGE FORM

Raudixin (*Rauwolfia serpentina*, Squibb) is now supplied in tablet form by *E. R. Squibb & Sons*. Raudixin is prepared from the powdered root of the shrub, *Rauwolfia serpentina*, which grows in the foothills of the Himalayas. It is especially recommended in relatively mild cases of hypertension requiring a weakly hypotensive agent. Two 50-mg. tablets, morning and evening, may be initially prescribed, a dosage that may safely be increased if necessary.

STILBAMIDINE

Stilbamidine is available from *The Wm. S. Merrell Company* in ampuls containing 150 mg. stilbamidine isethionate sterile powder. It is indicated for treatment of blastomycosis and leishmaniasis. *Stilbamidine must be given only under careful medical supervision.* All solutions must be freshly prepared within one hour before use by dissolving in 200 cc. of 5 per cent dextrose injection or sterile isotonic sodium chloride solution, and the solution should be protected from sunlight. The suggested dose is 150 mg., given intravenously by continuous slow drip, and should be repeated every 24 to 48 hours. A course of therapy is usually 15 injections of 150 mg. each. (Precautions and contraindications should be known in advance of therapy.)

VARIDASE JELLY—NEW DOSAGE FORM

A new jelly form of Varidase streptokinase-streptodornase has been placed on the market by *Lederle Laboratories Division, American Cyanamid Company*. The package includes a 15-cc. jar of water-soluble jelly and a separate vial of Varidase. The jelly enables the physician to apply Varidase to the wound with a dry bandage. This means that Varidase—formerly applied in wet dressing form—can now be used on ambulatory patients without inconvenience. Jars of the jelly are available separately.

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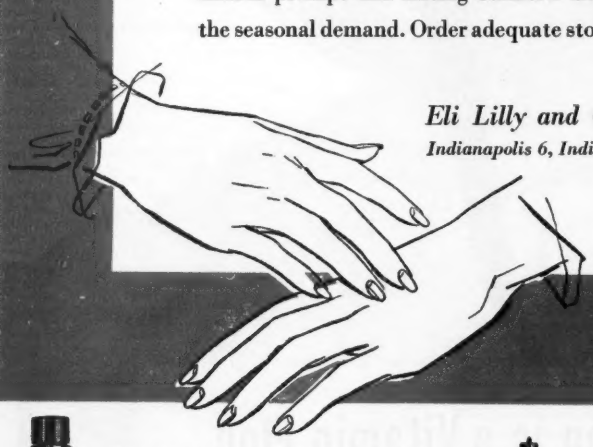

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